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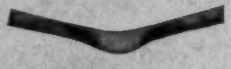

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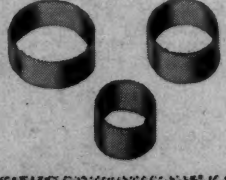

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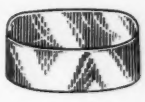

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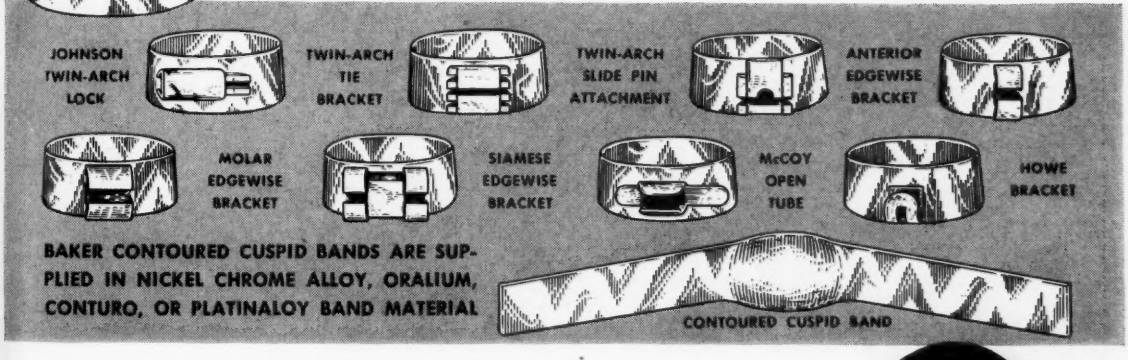
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J. Lyndon Carman, General Chairman of the next annual meeting of the American Association of Orthodontists, which will be held in Denver, Colorado, April 16 to 21, 1961.

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VOL. 46 NOVEMBER, 1960 No. 11

Original Articles

PROFESSIONAL AND PUBLIC RELATIONS

C. EDWARD MARTINEK, D.D.S.,* DETROIT, MICH.

SINCE this is the first John V. Mershon Memorial Lecture, I feel obliged to make some comments concerning the lectureship itself. In 1958 we received a letter from Dr. John W. Ross, in which he stated there was some prospect of Mrs. Mershon establishing a trust to commemorate the memory of her late husband.[1] The trust was established and involved a certain amount in cash and other securities which would yield an income to support the John V. Mershon Memorial Lecture for the annual session of the American Association of Orthodontists. It was agreed that the committee selecting the person to deliver the lecture in a given year should be composed of the president of the American Board of Orthodontics, the president of the American Association of Orthodontists, and the Program Committee chairman who will be occupying such offices during the annual session for which the selection is being made.

Since the time that the deed was executed, there has been some question regarding the tax status of the American Association of Orthodontists. According to a recent ruling from the United States Treasury Department, our Association does not have to pay a tax on income received. Donors who might choose to make gifts to our Association are required to pay a tax on that donation, however, since we are not considered a scientific, religious, or educational organization. Consequently, the funds bequeathed to the American Association of Orthodontists by the John V. Mershon estate are subject to state tax and income tax on the income received from the property during the term of ownership by Mrs. Mershon. The additional tax which the estate will be required to pay on the basis of our classification amounts to about $6,500.00. At the present

The John V. Mershon Memorial Lecture, presented at the annual meeting of the American Association of Orthodontists in Washington, D. C., April 25, 1960.

*Lecturer in Dentistry, Graduate Department of Orthodontics, University of Michigan.

time an effort is being made to have this tax spread over the entire estate received by the residual beneficiaries, rather than having it entirely concentrated on the single bequest to the American Association of Orthodontists. Most of this has already been reported by President Anderson.

It is quite possible that many of our younger men may not be too familiar with the identity and accomplishments of Dr. Mershon. Therefore, I feel it proper that the initial lecture describe him.

Dr. Mershon was the first recipient of the Albert H. Ketcham Memorial Award. For further description, I shall quote from an "Orthodontic Profile" written by Leuman M. Waugh[2]:

> John Valentine Mershon was a simple, kindly, and unpretentious man who was endowed with qualities of mind and heart that marked him as a great personality. As long as there is a specialty of orthodontics, he will be known for his quiet, genial, and generous efforts to help others. His gentle nature won him many friends, from little children to case-hardened colleagues who may not have seen eye to eye with him.

Dr. Mershon practiced orthodontics in Philadelphia. His life covered the span from 1867 to 1953. From 1908 until his death he limited his practice to orthodontics, and during his career he exerted considerable influence on orthodontic thinking and practice. He was one of the pioneers in the use of light forces for the movement of teeth. He had a large orthodontic practice and received his original orthodontic training in the Angle School of Orthodontia.

During much of his professional life he was a teacher, and he served as head of orthodontics at the University of Pennsylvania. He was one of the pioneers in furthering the notion that orthodontics should be taught in the graduate school of dentistry.

To further appreciate the stage on which Mershon appeared in orthodontics, I again quote from Waugh[2]:

> In order to evaluate Dr. Mershon's contributions to advancement, one has to consider the state of orthodontics over a half-century ago. At that time the health service professions, and, to an appreciable extent, the laity, were questioning whether teeth could be moved safely into new positions. Will the pulps remain vital? Would the uncompleted roots of growing teeth be bent? Or the apical ends be prevented from normal formation? Would the bony structure of the alveolar process be strong, and would teeth moved by orthodontic means be retained as long? Would appliances not increase dental caries? Would irritation of gum margins during treatment not predispose to pyorrhea? Could orthodontic treatment be given without causing too great a physical or nervous strain on the young patient? Many dentists and physicians were skeptical, and the procedure was too new to permit positive statements.

Obviously, the problem of professional and public relations was already here. Some of these questions remain.

I am indebted to Joseph Eby[3] for a collection of axioms that he made from the works and comments of Mershon. Some of these follow:

1. No two cases ever respond to the same treatment in the same way.
2. It is the *vital processes* in the developing child that cause teeth to change their positions and not the appliance.
3. You can place teeth to where you *think* they belong—Nature will move them to where they will best adapt themselves to the rest of the organism.

4. Orthodontics is a problem in biology.
5. Perfect alignment is not a standard of normality.
6. Teeth cannot be moved as you think or see fit any more than a child will grow as you see fit.
7. You cannot create in a man that which is not born in him.
8. There is a limit to inherited possibilities.

The more I think of some of those axioms, the more I gain awareness of our professional and public relations problem. In fact, it appears that orthodontics and the profession of medicine may have a few differences of opinion, too. Pediatrics, maxillofacial surgery, and orthopedics are but a few of the areas in which there is mild overlapping with orthodontics.

Of further note are some of the concepts held by the public. The "relations" problem has become important to orthodontics, to dentistry as a whole, to medicine, and to the public.

How well are we managing the total problem? Actually, orthodontics has met it quite well. We have never failed to attempt to face an issue, and our high sense of responsibility to our mother organization (the American Dental Association), and to the public welfare commits us to a continuation of that policy.

Several issues are in need of a better understanding. One of these is referral of patients from one orthodontist to another. Dr. West[4] was aware of this when he presented his president's address to the American Association of Orthodontists in San Francisco in 1955. The committee on Dr. West's address confirmed the recommendation that the Association proceed with the appointment of a special committee to study the problem and report at a later date to the Board of Directors on the proper handling of the transfer of patients for continuation of treatment. The committee appointed consisted of Eugene Kelly, Herbert Jaynes, and Scott T. Holmes (chairman). At the next annual session of the American Association of Orthodontists this committee made its report,[5] which was received with high acclaim. Perhaps for this and other reasons, Dr. Pollock[6] decided to comment editorially on the report and to reprint it a year later.

While the Committee on the Transfer of Patients accomplished a tremendous amount of good, it is apparent that their suggestion that the problem be reemphasized from time to time was a wise one. Many instances have been reported recently which indicate that once again orthodontists are getting a little careless in the manner in which they refer cases to one another. It is for that reason that I call the matter to your attention now.

As with transferrals, we have been alerted in the past to many other problems that need additional emphasis. Included among those problems is the notion that the orthodontist should be able to correct dentofacial anomalies to an ideal result every time.

On countless occasions it has been implied in the literature that there are limitations to orthodontic treatment. Despite this, there remains a lingering reluctance to show results of treatment which are somewhat less than ideal. This

is surprising when it is noted that outstanding leaders in our profession have admitted their inability to obtain an ideal result in every case.

In 1951, before the annual session of the Great Lakes Society of Orthodontists, Dr. Strang[7] gave the following opinion:

> To obtain this ideal it is essential that all structures, intraoral and environmental, shall be normal. Such perfection of parts is not to be found in cases of malocclusion, or malocclusion would not be present. Furthermore, there are very few cases of malocclusion in which the operator, no matter how skillful, can bring back perfection of the various parts that are contributory factors in the production of malocclusion.

Since Dr. Strang is a highly regarded colleague in our specialty of orthodontics, and one of the most honest and efficient, it seems that the limitations of orthodontics were sufficiently stressed by him.

Before I go further in pursuing this notion, I should like to place a restriction on the philosophy by one additional quotation from Dr. Strang[7]: "However, knowledge of limitations must never tend to lower our ideals."

Along with the frank readiness of experienced orthodontists to face limitations, one must include the advanced requirements of the American Board of Orthodontics. They ask that records of cases out of retention be presented. It is acknowledged that many candidates for examination are reluctant to do this, in spite of efforts by the Board to stress the point it is interested primarily in the truth.

In connection with the preceding point, I focus my attention on the notion that orthodontics is capable of moving teeth into any conceivable position and making them stay there.

It may be redundant for me to remind all orthodontists and pedodontists that treatment is basically a biologic matter rather than a problem of engineering or mechanics.[8] Genetics, appraisal of the skeletal pattern, reconciliation of integumental profile with the skeletal pattern, ethnic and health consideration, tooth size as compared with basal bone, understanding of cellular changes in tooth movements, the influence of muscles of facial expression and mastication, facial growth, and many other biologic considerations are involved. These essential requirements limit the orthodontist's ability to move teeth indiscriminately with the assurance that they will remain in their new positions.

Moreover, this limitation is encountered regardless of the appliance system used by the orthodontist. In the past, emotions held rather firmly to the idea that the appliance was *the thing*. Fortunately, this mechanistic answer to a complex problem is on the decline. Apparently, it is now agreed that the knowledge of the orthodontist and not the appliance of choice is what counts.

In this regard, I should like to quote Allan Brodie as follows:

> All such arguments dignify the importance of the appliance over the more important aspects of training. It is more vital to know what to do and when to do it, than it is how it should be done. A man with reasonable intelligence can solve most of his mechanical problems in a variety of ways.

Discussing the same problem, Wylie[9] said:

> If it is necessary that orthodontists be classified at all, I sincerely hope they will not be classified much longer on the basis of their hardware. The man's view of objectives, his

limitations, and his ability to obtain those objectives are the important factors. While I have had no training or experience with the Johnson twin wire, I confidently believe that if a transferred case came to me with such an appliance in place and well constructed, I could, out of my experience with the edgewise arch, carry the case to a successful completion.

More recently, at the meeting of the alumni of the University of Michigan Department of Orthodontics, Tom Graber gave an excellent demonstration of how he adapts his appliance of choice to the needs of treatment. It was obvious that the biologic thinking behind his appliance therapy, and not the appliance itself, was the important consideration.

If we have given dentistry and the public the impression that we are always able to produce ideal results, that we are endowed with the skill to place teeth wherever we choose with assurance that they will be balanced and self-retaining, and that we should be judged by the appliance we use, we must admit to some mismanagement of professional and public affairs. There is further evidence of mismanagement in our inclination to estimate length of proposed orthodontic treatment.

Some years ago I made an effort to ascertain how long my patients who were undergoing what we described as major orthodontic therapy were actually under treatment. I became aware of the fact that orthodontists computed this in various ways. Some dated it from the time the original records were made until the patient was placed under retention. This was the standard upon which I made my calculations. Others, to my great surprise, calculated treatment time from the date all appliances were in place until the date it was recognized that the patient was ready to be placed under retention. It appears that when we read in the literature that treatment time for Patient X was a stated number of months, this means nothing unless we know the basis of reporting.

For several years I have maintained a bulletin-board list of patients who received what we described as major orthodontic treatment. Their names were added to the list in the order in which they were placed in retention. The original purpose of the list could probably be attributed to general curiosity. However, the list eventually gave rise to some rather important implications as far as I was concerned.

Among the first of these was the question of the length of treatment for such patients from the time original records were made until retaining appliances were placed. Records of the last 600 patients on the list, at the time we made the investigation, showed that between 65 and 70 per cent of our patients required treatment of two years' duration or less. The balance of those patients underwent treatment for three or more years. The disclosures were disappointing, mostly, but they were factual.

For obvious reasons, this led to the second consideration of seeking an explanation for the differences in length of treatment times. A study of the written records readily produced the explanation, which was overwhelmingly *lack of cooperation from the patient.* While I could elaborate on this at length,

I shall simply identify the cooperation void as being primarily concerned with three items, as follows: (1) repeated appliance breakage; (2) failure to wear elastics as prescribed; and (3) failure to keep appointments.

At each of the initial appointments the question was asked: "How long will it take to produce a result?" Is there one among us who can give a reasonable estimate of probable lack of cooperation?

Up to the present, this article might lead one to take the viewpoint that, after all, our public and professional relations problem is a small one that is not too involved or seriously distressing. As we develop the question further, you may reconsider the reasonableness of such a viewpoint.

At the time that Angle (and Mershon, too) became interested in orthodontics, the specialty had already entered an era of progress that has continued on a more or less accelerated basis ever since. As this era began to unfold,[8] there was a feeling of disappointment that, while orthodontics was considered a part of dentistry, it was almost completely excluded from the curriculum of nearly every dental school in the country. During the next few decades more and more undergraduate programs did include orthodontics, but the gestures were mostly of a token[8] nature. There was little undergraduate interest, capable teachers were scarce, and heads of the various departments within nearly every dental school strongly resisted relinquishing time to provide for the teaching of orthodontics. I would estimate that the majority of dentists practicing today have had less than 100 hours of undergraduate training in that subject, and possibly less than fifty hours.[10, 11]

During the past fifteen or twenty years there has been a change in attitude. More time has been provided for undergraduate instruction in orthodontics, and the teacher problem has improved. Even the objectives of undergraduate instruction have been expanded to make for a better understanding of facial growth, recognition of developing or existing malocclusion, elementary instruction in etiology, and a greater awareness of the additional skills necessary to treat dentofacial anomalies.

Although these undergraduate objectives are modest, it is held that they would require reservation of 300 hours in the dental curriculum. As of now, very few dental schools have been able to allocate that much time. Evaluation of the intent of such a program may be made by observing that an additional 1,500 to 3,500 hours are required to train the specialist in orthodontics.

Except for the University of California, where a small number of carefully selected undergraduate students are permitted to digress early in their dental training toward orthodontic specialty preparation, extra training toward specialization is procured in other schools on a postgraduate or graduate level. At least 80 per cent of the men currently entering our specialty are trained in this manner. I rejoice that Angle and Mershon were able to note this trend before their careers came to an end.

All this progress in orthodontic education is the result of several contributing sources, among them being the American Association of Orthodontists, the American Board of Orthodontics, the American Dental Association, and the American Association of Dental Schools. Of major influence, too, were efforts

on the parts of state boards of dental examiners leading to the adoption of specialty laws in nine states, namely, Illinois, Kansas, Kentucky, Michigan, Nevada, Oklahoma, South Carolina, Tennessee, and West Virginia.

What has motivated all this? The plain answer is the desire to contribute to the public welfare by improving the quality of service through better orthodontic training programs and by making it possible to accept an increasing number of dentists studying under those programs. Graber[12] has offered the following opinion:

> If the tremendous increase in graduate education continues at the same rate as it has the past twelve years, then the many remaining schools should have graduate programs before too long. Projecting the same rate of increase for seven years, by 1965 there will be at least four hundred to four hundred fifty students in graduate and postgraduate training. This figure is over twenty percent of the entire membership of the American Association of Orthodontists today! From present figures and future projections, it would seem that we are meeting the challenge of an increasing demand with an increasing supply.

I do not wish to imply that all dentists who choose to qualify for specialty status augment their undergraduate training in orthodontics by 2,000 or 3,000 additional hours on a graduate or postgraduate level. Dental schools have not been able to meet the demand but are now making great strides in that direction, as described by Graber. As a transitory measure, preceptorship has been accepted as a substitute. For the present, this is a carefully controlled method of supplementary training.[13] In 1953 trainees with postgraduate or graduate education and those with preceptorship experience were about equal in number. Five years later the proportions had changed, only 10 per cent qualifying by preceptorship. Obviously, preceptorship training decreases as dental schools offer additional opportunities for graduate instruction.

As quality and number of orthodontic training programs advanced, there was also a betterment in our professional and public relations. Now some fear is expressed that those relations might be headed for a period of decline. This fear is based upon the impression that treatment of dentofacial anomalies is being attempted by an increasing number of dentists in metropolitan districts who have had no training at all in that phase of dentistry or whose training is severely below the level currently considered essential to suitable professional and public service.

Upon what information is that impression founded? The information comes from several sources. Officers and committee chairmen of the American Association of Orthodontists have received many protests from family dentists, the public, and medical personnel concerning specific cases in which results of treatment by nonorthodontists were challenged. The increase in these protests during the past five years has been formidable. Local ethics committees are aroused. There has been a surge in the number of patients treated under those conditions who are now seeking subsequent consultation in dental schools. Orthodontists throughout the country have made similar observations and believe that something must be done to curtail a trend which is believed to be harmful to the public and which may impugn the integrity of the dental profession.

Doing something about this trend is not made easier by the fact that every dentist is licensed by law to practice all forms of dentistry.[14] All that we may do to meet this challenge is to encourage suitable publicity of the facts. Greater than licensure itself is the legal viewpoint[15] that a dentist is liable to charges of malpractice if he fails to possess and employ the knowledge and skills ordinarily regarded as necessary and proper according to the standards to which other dentists in the same locality conform. It is appropriate to reflect further on the degree to which that liability is compounded when the dentist digresses further from accepted standards by placing dependence upon the advertised claims of some dental laboratories[16] which imply that they are able to diagnose and establish treatment objectives for dentofacial anomalies!

There have even been numerous protestations against the amount of orthodontics that some pedodontists are currently doing and the amount of orthodontics that they propose to do in the future. Moreover, pedodontic literature lately has included some provocative and challenging statements.[17-20]

After so many years of harmonious efforts in behalf of children, it came as quite a shock that suddenly a difference in ideologies seemed to have arisen between pedodontists and orthodontists. On several occasions during the past year some officially arranged conferences involving both specialty groups have been held for the purpose of discussing the apparent differences. These meetings were encouraged by the A. A. O. Committee on Related Organizations (Ernest Klein, chairman).

The conferences have been most delightful. Above all, they reaffirmed our mutual dedication to the welfare of children. They proved that these two specialties of dentistry are anxious to complement one another in their services, that they are able to consider issues in an intelligent and friendly way, and that there is a real desire by both groups to have more of these discussions in the future.

The entire report by Dr. Klein was given to the Board of Directors yesterday. Because I feel that our Association as a whole might be interested in this matter of professional and public relations, I shall quote a portion of that report[21]:

> Inclusion of interceptive orthodontics in the graduate training program for pedodontists has aroused many orthodontists to expressions of concern. They wonder about the extent to which pedodontists trained in that manner overlap the field of the orthodontist. Is the overlapping great or small?
>
> Most graduate training programs for pedodontists include orthodontics as just one of the many skills to be acquired. Thus, the amount of orthodontics learned is limited. Certainly, the students do not become qualified to manage complex anomalies, and many borderline occlusion problems can be treated only after guidance from the orthodontist. Thus, the degree of overlap is small.
>
> Just how much orthodontics should the pedodontist do? The logical answer surely must be: "As much as he is qualified to do by training." The qualification will vary between pedodontists trained in different graduate departments as the amount and quality of instruction varies between those departments. It will also vary between graduate school-trained practitioners of the specialty and those pedodontists who had no special training at all or training limited to a few "short" courses.

In the conferences held with pedodontists leading to the portion of Dr. Klein's report just quoted, I had the pleasure of representing the American Association of Orthodontists. Pedodontics was represented by Dr. William Brown, president of the American Society of Dentistry for Children; Dr. Kenneth Easlick, president of the American Board of Pedodontics; Dr. Joseph Hartsook, president of the American Academy of Pedodontics; and Dr. Alfred Seyler, editor of the *Journal of Dentistry for Children.* While our meetings did not have the intention of solving all issues pertaining to our area of overlap, there was hope that they might lead to some basic understanding that would permit future consultations in the highest professional tradition. I believe that we have succeeded in that respect.

As orthodontics continues its efforts toward finer relations with all segments of our profession, with collateral fields, and with the public, it seems that there is at least one fundamental requirement: Orthodontics is in need of taking a real look at itself.

Have we evaluated accurately the over-all benefits of palliative, interceptive, or early treatment of dentofacial anomalies? Is the usual estimation of such treatments of proved value? Are we certain that anomalies regularly become greater treatment problems if therapy is not applied until, say, Hellman's stage III B? Is serial extraction an easy question that may be answered by casual judgment, or is it a profound one that challenges the most in judgment and discernment? Is the Golden Rule the dominant theme in our precepts of practice administration? Has the specialty of orthodontics become preemptory? Our problems are many, indeed.

Reflecting upon the serious implications of those problems, I recall that Gaston[22] has described our obligation by emphasizing some aspects of the principles of ethics of the American Dental Association and the American Association of Orthodontists. He has quoted the following from those principles:

> The practice of dentistry first achieved the stature of a profession in the United States, where, through the heritage bestowed by the efforts of many generations of dentists, it acquired the three unfailing characteristics of a profession: education beyond the usual level, the primary duty of service to the public, and the right to self-government.
>
> The maintenance and enrichment of this heritage of professional status place on everyone who practices dentistry an obligation which should be willingly accepted and willingly fulfilled. This obligation cannot be reduced to a changeless series of urgings and prohibitions for, while the basic obligation is constant, its fulfillment may vary with the changing needs of a society composed of the human beings that a profession is dedicated to serve. The spirit and not the letter of the obligation, therefore, must be the guide of conduct for the professional man.

I consider it an honor to have been selected to present the first John V. Mershon Memorial Lecture. In fairness to our friend, Lowrie Porter, you should all know that he was originally chosen to deliver the initial lecture. Then, a year ago, he had a heart accident and concluded that it would be unwise to proceed with the lecture. I am happy to report that he has made a delightful recovery.

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ORTHODONTIC DOCTRINE AND MECHANICAL TREATMENT METHODS

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THE orthodontist of today has at his disposal means of treatment that are almost unlimited in their variety and efficiency. The technical proficiency required to make use of these means can be acquired in time with the exercise of patience and the study of method. Yet it cannot be said that the same precision and efficiency can as easily be achieved in the matter of making decisions as to exactly what are the best tooth readjustments to make in the treatment of any individual malocclusion.

The reasons for adopting any given treatment plan are to be found in a background of doctrine, and they manifest themselves in the mechanical treatment procedures that are finally carried out. It is my purpose in this article to explore the nature of the connections between treatment rationale and the mechanical treatment procedures to which it leads.

In the beginning, doctrine and treatment measures were almost the same thing. The presence of an irregularity of the teeth was indication enough for the application of pressure to the displaced tooth or teeth by screw, peg, or ligature to produce a better alignment of the teeth in the individual arches.

As ideas on the nature and causation of malocclusion developed, and as mechanical treatment methods improved, the connections between these two aspects of orthodontics became less direct. Orthodontic doctrine became more complex, and in different parts of the world orthodontists took different attitudes toward the problems of irregularity and malocclusion.

To a great extent, the differences in orthodontic doctrine have a geographical distribution, and the basic attitudes toward the matter might be traced to the traditions of dentistry and dental teaching in different countries.

In Continental Europe, orthodontic doctrine appears to be infused with ideas drawn from surgery and pathology, which may arise from the fact that dentistry is practiced to a considerable extent by those who have medical qualifications. Discussions of the etiology of irregularity and malocclusion by these practitioners are distinguishable by their references to pathologic, developmental, and environmental factors which, in certain circumstances, produce malformations of the craniofacial complex and, by implication, may be related to irregularity and malocclusion of the teeth as it is seen in the orthodontic clinic.[19, 21, 22]

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In America, dentistry appears to have enjoyed an independence which has encouraged and promoted its development by dentists alone whose interest and attention are centered first on the teeth and the occlusion. For a time this approach to the subject from the opposite direction, as it were, to that of the Continental Europeans, led to a concentration on the development of technique and the present American pre-eminence in this field. This trend, however, caused difficulty in doctrinal evolution for a time, to which reference will be made again later.

In the British Isles, dentistry has always been closely linked to medicine. However, while dentists pursued their basic science studies in medical institutions, it was not necessary for them to acquire medical qualifications, and the connection has been with medical science rather than with medical practice. Orthodontics in these islands has been chary of formulating comprehensive doctrines. It has tended to regard the individual patient and his occlusion as unique and to approach each case as a new problem.

It would not be true, of course, to say that these doctrinal attitudes were unanimously adopted, that they were confined within the geographical areas mentioned, or that further and more recent developments have not taken place. In general, however, the trends of thought in these different countries seem in the past to have been along the lines suggested.

Each of these attitudes can be seen to find its expression in technical methods and procedures adopted in the treatment of malocclusion. Thus, we see the American concept of treatment to perfection with such appliances as the edgewise arch; the continental tendency to early treatment of malocclusion on the ground that anomalies of sucking and disturbances of oromuscular function determine the course of later malocclusion[14]; and the British concept of malocclusion as a very individual matter to be treated with the impartial use of fixed or removable appliances, every case being to a great extent a law unto itself.

The fact that all these basic concepts and mechanical treatment systems flourish side by side suggests widely differing approaches in different countries to the nature, causation, and most effective means of treating malocclusion. This points to a need to investigate the way in which different schools of orthodontic thought organize their ideas on the subject and to aim at establishing an area of common ground in the matter of orthodontic doctrine and its application to treatment.

Orthodontic doctrine may be considered, first of all, from the point of view of those who practice orthodontics and, second, from the point of view of those who are interested in orthodontic problems and their explanation although they do not have to deal with them in detail.

THE ORTHODONTIST AND HIS DOCTRINE

Orthodontics grew from a human clinical need. The orthodontist began by dealing with his problems as he found them. Then he began to formulate his ideas on the causation of irregularities and malocclusions in the light of clinical observations and always with a strong tendency to try to discover

simpler or better forms of orthodontic treatment. Trouble really began to arise when the orthodontist attempted to put into words his reasons for carrying out the treatments that he did.

It was once remarked to me that orthodontists should teach only on the condition that they shall not speak to their pupils.[25] It was thus implied that if the student watched carefully what his teacher did and pondered what he saw, he would be less likely to get a wrong idea than if the orthodontist tried to explain what he was doing and why he was doing it. (There is many a true word spoken in jest!)

The reason for this advice was that active teaching demands dogmatism, to some extent at least. Most students expect this, as it leads to the setting-out in categorical terms of a field that can be learned. This, indeed, is a worthy aim as far as it goes, but often the aim reaches too far and seeks to provide in a dogmatic statement a concise set of rules that can be applied, perhaps in various combinations, to meet the needs of any and every treatment problem that is likely to arise. The desire for such an approach comes from both sides, from the teacher and from the pupil. From the teacher's point of view, the putting down of explicit statements helps to sort out the complexities that often arise in case analysis and classification. As for the student, when he is faced with a difficult treatment problem he can, as a last resort, seek refuge in the application of a rule or principle that he has learned.

The unfortunate truth is, however, that simplifying and dogmatizing for teaching purposes can lead to oversimplification and the suppression of important and relevant detail. Irregularity and malocclusion can be recognized easily enough by any practitioner of dentistry and even by the layman. In spite of all the emphasis placed today on the teaching of fundamentals and basic principles, however, it is only through daily meeting with malocclusion on a wide scale that the orthodontist gradually develops the faculty of noticing the smaller details of the differences between cases that to outward appearances are very much alike. It is this fact that leads to the conclusion by students that an orthodontist will treat apparently similar cases in different ways and give different explanations for the treatments that he advises in apparently similar conditions.

The difficulties encountered in enunciating a comprehensive orthodontic doctrine become clearer if some of the concepts or philosophies of the past or of the present are examined critically.

The Angle Doctrine.—In all discussions of basic orthodontic problems, Edward H. Angle[2] inevitably comes to mind as a devoted orthodontist and teacher and a brilliant technician and designer of orthodontic mechanisms. He aimed always at perfection in all things biological as well as mechanical. He strove to achieve perfection in the arrangement of the teeth and in facial harmony, and thirty years ago, in order to achieve his purpose, he designed and perfected the mechanism that would do just what he aimed at. His doctrine and his mechanical means complemented each other to perfection.

It is, of course, well known that this doctrine maintained that "the best facial harmony requires a full complement of teeth and that each tooth be made

to occupy its normal position—normal occlusion." One of the foundations of his rationale was that acceptance of this doctrine as law, to be regarded as a cornerstone of the new school of orthodontics, made it no longer necessary to exercise judgment in the extraction of teeth in the treatment of irregularity and malocclusion. The law was all-embracing and positive in contradistinction to the complex, difficult, and probably impossible task of laying down rules for the guidance of the inexperienced in the role of tooth extraction in the treatment of malocclusion. Angle considered it fallacious teaching and pernicious practice to leave to the individual judgment of the operator the decision as to whether or not teeth should be removed as part of orthodontic treatment.

The practical aspects of Angle's doctrine found expression in the edgewise arch mechanism, evolved from the buccal or labial arch appliance used as an expansion mechanism. In the course of time Angle's genius, taking this mechanism through its developmental stages, added to it the properties of complete control of tooth position, including the possibility of producing mesiodistal tipping and buccolingual movements of crown or of root at will.

The passage of time has revealed that the rigorous application of Angle's doctrine through the mechanical method of treatment which complemented it was not justified; the relationship between doctrine and treatment method did not always hold good. The doctrine is now dead, but the mechanism lives on; it was, in fact, too good to let go, but its use is now linked with a doctrine or treatment rationale of a different kind.

Since the time when it was generally recognized that lateral expansion to full arch form as a universal treatment aim is no longer desirable, the expansion property of the arch has been applied with greater regard for ultimate stability of the final result, and the edgewise arch mechanism is looked upon as essentially a mechanism for the mesiodistal movement of teeth. The need for distal tipping of buccal segments as emphasized by Tweed[36] in the treatment of a wide variety of malocclusions is met by the use of the edgewise technique, so that here again doctrine and technical means complement each other.

The Wilkinson Doctrine.—Let us turn for a moment, by way of contrast, to a doctrinal and technical simplification of the most sweeping kind. Wilkinson[38, 39] put forward the view that the crowding which, he suggests, results from the fact that the Anglo-Saxon jaw is too small to contain the full complement of teeth could be relieved by removing the four first permanent molars and that no mechanical treatment would be needed. This seemed excellent from the theoretical point of view. The doctrine, however, fell to the ground for the reason that in most cases creation of space by such extractions could not alone be relied on to produce spontaneous alignment of teeth mesial to the space, and in certain types of cases the loss of the teeth in question could be disastrous to the occlusion as a whole.

The simplicity of this orthodontic doctrine and of its practical application was more apparent than real, and the gap between theory and practice was so wide that only considerable clinical experience could bridge it and successfully apply this extraction rationale to the small percentage of cases that require it.

The Andresen Doctrine.—Andresen observed that in some cases the abnormalities of tooth position and relationship produced by the pressure exerted by digit-sucking could be large and of a permanent nature. This led him to reason that if undesirable and permanent movements of teeth could be produced by the application of muscular pressure about the dental arches, it should also be possible to produce desirable and equally permanent tooth movements by the same means.[30] The Andresen system of treatment, making use of the pressures during function in the jaws and dental arches, arose in this way, and it was found that in certain malocclusal conditions dramatic improvements in dental arch form and relation could be produced.

The effectiveness of the Andresen system in conditions to which it is suited can encourage its use in circumstances to which it is not so well adapted. It is possible to direct the forces of jaw closure to the detail rearrangement of individual teeth in the arches by means of the Andresen appliance, but such tooth movements are more efficiently performed by simpler means, and attempts to use the Andresen system as an all-embracing method for mechanical treatment lead to failure and frustration and mistrust of the system in any connection. The relationship between doctrine and technical application in these circumstances has become strained to limits which it cannot tolerate.

The controversies that have arisen over orthodontic doctrines in the past are probably due to the tendency of orthodontists to formulate their doctrines in close relationship to their clinical problems. There seems to be a desire to explain every condition that is found as if the terms of the explanation were complete, and when an explanation is found to be of practical value in relation to a number of cases which have certain similarities it is formulated as a doctrine without precise specification of the similarities or without determination of which of the similarities are significant. Hence, it is taken, even by its originator, to have wide application. This tendency can be seen in every orthodontic doctrine of the past and of the present.

Current Doctrines.—

Facial growth: Many years ago, Brash[5] suggested, in discussing the growth of the head as a whole from birth to adulthood, that although the face grew proportionately more than the cranium the facial proportions themselves remained about the same (Fig. 1).

Hellman,[16] from the measurement of a large number of skulls of various ages from a homogeneous social group, showed that the facial dimensions, on the whole, grew and expanded in an equally proportional manner from infancy to adulthood.

Still later, Broadbent's[7] original investigations (Fig. 2) on living persons supported and reinforced these views that the pattern of the face remains the same, and Brodie,[8] investigating the earliest phases of postnatal growth (Fig. 3), concluded in 1941 that the facial pattern for the individual, once established, did not change.

These conclusions, stated simply and translated to the clinical field, provided the orthodontist with a working doctrine within which he could plan his

approach to tooth rearrangement on the assumption that the basic bony framework within which he worked represented a stable pattern. If this is so, it must follow that the possibilities and limitations of orthodontic treatment in certain types of facial disproportion could be determined at an early age.

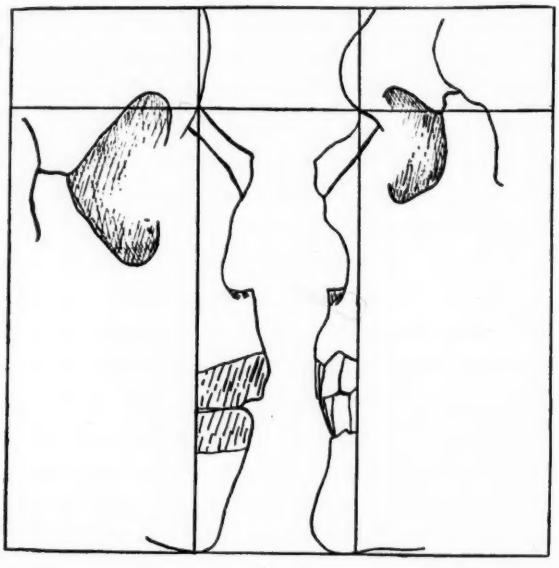


Fig. 1.—By making the drawings of a newborn child's skull and of an adult's skull the same size, the late J. C. Brash showed that there is a general similarity in facial proportions in infancy and adulthood. (Reproduced from the original of Fig. 3 in Brash: The growth of the Jaws, Normal and Abnormal in Health and Disease, London, 1924, Dental Board of the United Kingdom, by permission of the General Dental Council.)

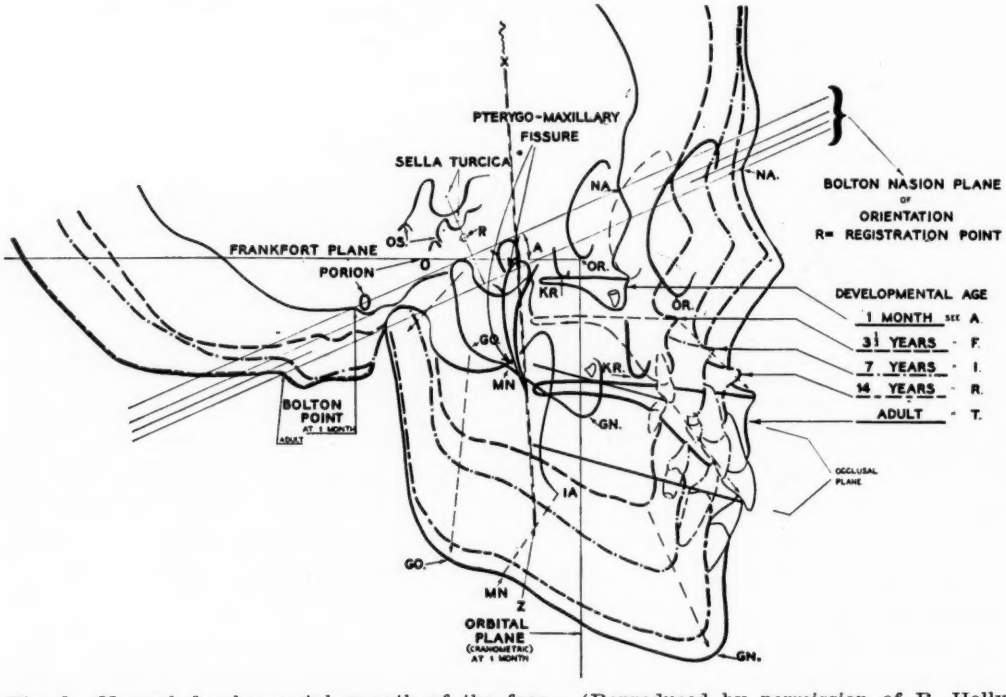


Fig. 2.—Normal developmental growth of the face. (Reproduced by permission of B. Holly Broadbent and the *Angle Orthodontist*.)

Later, however, Björk,[4] Lande,[24] Brodie,[9] and Nanda[27] studied the growth of the same persons over a more extended time scale and analyzed facial growth with reference to its various components and to its over-all outline. These investigations have suggested that facial proportions do change and that often small and sometimes not so small changes in facial plan may occur as the total structure makes its way to completion (Figs. 4 and 5).

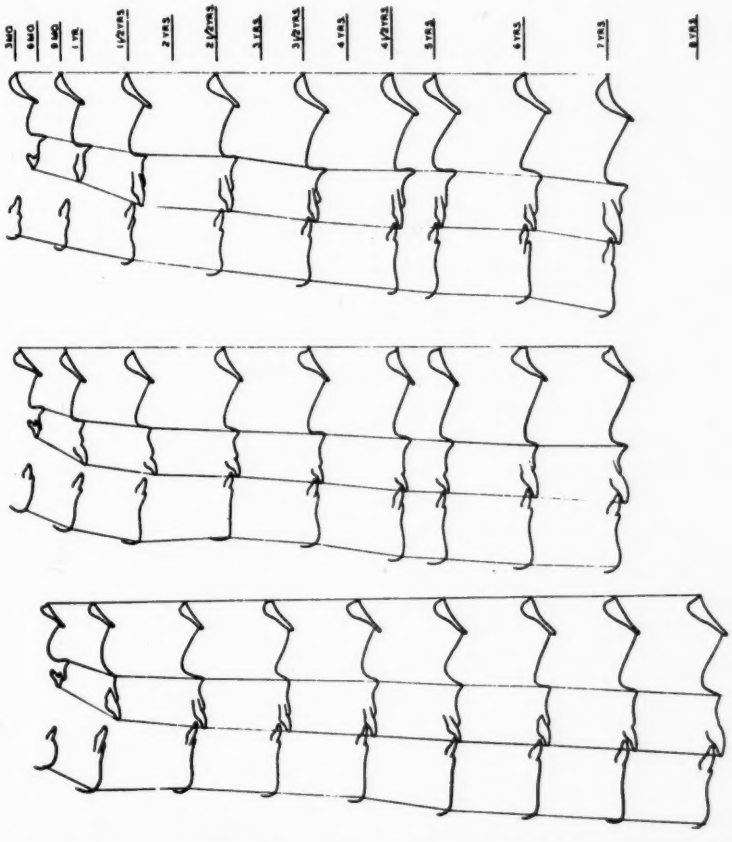


Fig. 3.—Growth of the facial outline of three persons between the ages of 3 months and 8 years. (From the original of Fig. 18 in Brodie: *Am. J. Anat.* 68: 247, 1941, by permission.)

The first conclusion is an attempt to define an entity, the basic face, and to establish facts concerning it as a foundation on which an orthodontic clinical approach could be built. The later findings, while apparently undermining that foundation, confer the positive benefit of showing the need for adopting a much more flexible attitude toward the question of the interpretation of growth study and its application to clinical problems than the first conclusions suggested might be necessary.

Muscular activity: The role of the musculature acting on and about the face, jaws, and teeth is one that has always appealed to orthodontists as seeming to provide clear and tangible evidence of a cause-and-effect relationship in the production of irregularity and malocclusion. The idea that tongue, lip, and cheek pressures could be held to account for a high proportion of occlusal anomalies goes well back into the history of orthodontics[20, 37] but has always

been held suspect as an etiological factor by one person or another. Notwithstanding the ancient lineage of the subject and Brash's[6] careful analysis of it thirty years ago, soft-tissue factors are still strongly in evidence today as subjects for discussion with respect to the etiological problem.

On the one hand, Brodie[10, 11] in America and Hovell[18] in England have been categorical in expressing their belief that the form of the dental arches is determined by the influence of the soft tissues of the tongue, lips, and cheeks.

Scott,[35] on the other hand, refutes this conception and removes the argument to the anatomic laboratory, concluding (and rightly so) that prior to their eruption the teeth are beyond the influence of the soft-tissue pressures of the tongue, lips, and cheeks and also that the palatal form at the fetal stage cannot be determined by the balance of functional activity between tongue and buccinator muscles. This was not, however, the point of argument; nevertheless, from the examination of fetal material, Scott goes on to argue that, even after eruption of the crowns of the teeth into the buccal vestibule, it is the surrounding soft tissues that adapt themselves to tooth position. He argues that while soft-tissue balance does not influence normal arch form, anomalies of soft-tissue function may produce abnormalities. It is difficult to understand how in one set of circumstances the influence of the soft tissues can be discounted while in another this influence can be held to be dominant.

Today malfunction of the orofacial musculature is believed to operate in a great variety of ways and to produce effects of the most widespread kind in the arrangement of the dentition. This may vary from causing 65 per cent of malocclusions through faulty sucking habits from birth onward, leading to defects in the formation of the maxilla and mandible themselves,[28] to the more detailed determination of a wide variety of anomalies of upper and lower incisor relationship with possible extension of the effects initiated here to the region of the buccal segments.[3, 32]

In the buccal region there is not much scope for refinement in tissue pressure effects. In the labial segment, however, there is much wider scope for variation in detail in the way the soft tissues might act to influence tooth position; many such variations in function have been described and their effects defined. Indeed, it is now assumed that the muscular pressures do produce the effects described, and argument centers on whether the behavior patterns or habits that produce these effects are consciously indulged in or are instinctive, innate, or inherent in the function of the neuromuscular system, with the prospects of permanent correction of tooth position depending on the basic nature of the soft-tissue anomaly that is alleged to lie behind the malocclusion.

The theoretical background of the subject is highly developed. It would seem that the time has come when a concerted effort to reach agreement on the means of recording and comparing the entities involved could be made and that this would lead to a wider measure of agreement on the significance of these undoubtedly important factors.

Practically all of the information available on this subject is obtained from the clinical observation of patients with established malocclusion. It is information recorded and conveyed by description and, as such, is subject to

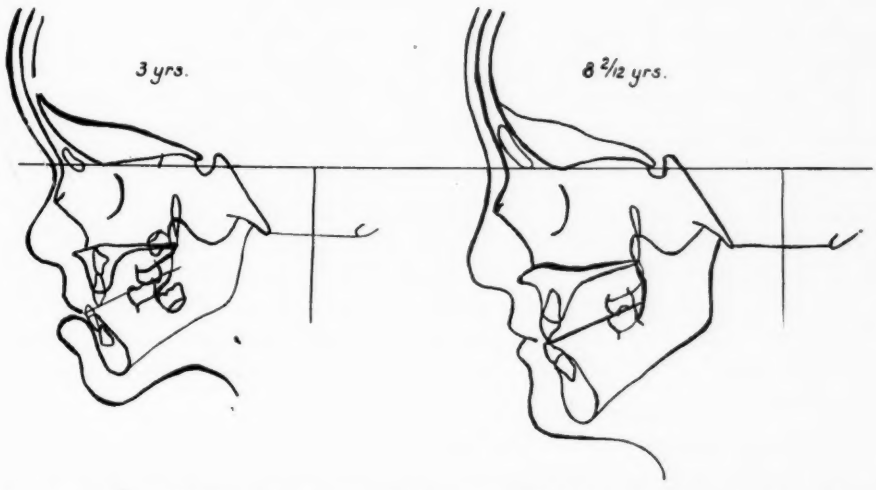


Fig. 4.—Facial diagrams of a girl at 3 and 8 years, during which period a Class III occlusion has changed to a nearly normal bite without the aid of treatment. (From the original of Fig. 13 in Björk: *D. Record* **71**: 197, 1951, by permission.)

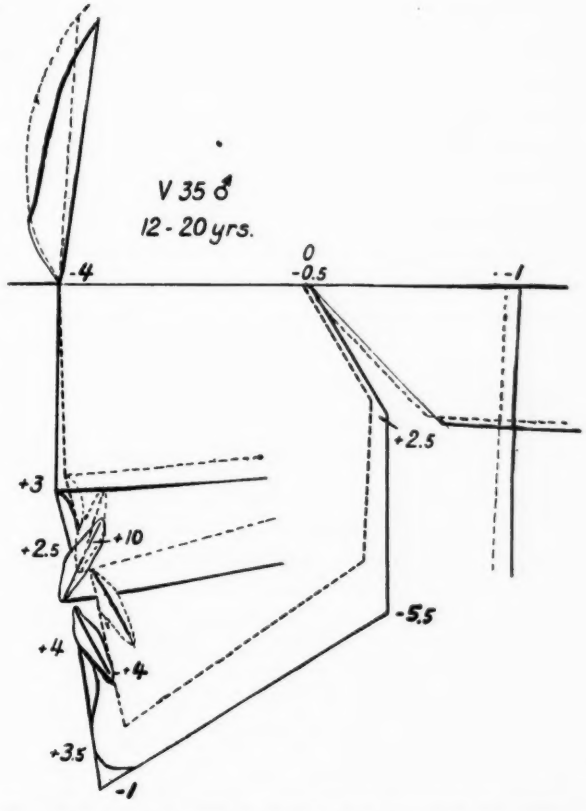


Fig. 5.—Growth analysis of a case in which the increase in prognathism during growth is greater in the mandible than in the maxilla. (From the orginal of Fig. 5 in Björk: *D. Record* **71**: 197, 1951, by permission.)

the vagaries that may be introduced by the difficulties that exist in making an objective assessment of complex activities. Attempts have been made to record objectively the functional activities of the orofacial musculature by cinematic and flashlight photography, but a little experience shows that efforts to record with clarity what is happening beyond the most obvious external contortions of the labial and facial tissues are beset with difficulties. Once a patient has been examined and asked to repeat an activity a few times, he becomes conditioned by this repetition and his efforts to cooperate may result in a pattern of movement that does not represent his unconscious habitual activity. When a photographic record is eventually made, it is likely to be a record of a performance that has been practiced and perfected as a result of the patient's efforts to be helpful and it may not be a correct record of what ordinarily and habitually takes place.

Perhaps in no aspect of orthodontic theory is there more acid controversy than that concerning the significance of the soft tissues in the determination of the arrangement of the teeth. Depending on the significance attached to this factor, treatment rationale and mechanical treatment methods can range from intervention at the earliest age with the simplest loose appliances to treatment at much later ages with the most precise fixed appliance techniques available.

Few orthodontists can entirely escape the conviction that the activities of the tongue, cheeks, and lips influence tooth position; some attach more significance to these factors than others. The greatest difficulty lies in deciding how to evaluate this significance and to define the circumstances in which soft-tissue factors are significant in determining malocclusion and those in which they are not relevant. If prognosis and treatment planning are dominated by consideration of soft-tissue function, the prospects for a particular case may unnecessarily be considered poor in spite of the fact that experience shows that treatment in the face of theoretically unfavorable soft-tissue influence can sometimes be successful.

The present state of divided opinion on doctrine relating to the functional aspects of the orofacial musculature is valuable in keeping the subject alive and in stimulating the struggle to reach agreement on its theoretical aspects. In the meantime, the present working hypotheses on facial and masticatory muscle activity are vital as guides to future investigation and useful in the clinical evaluation of functional anomalies and the treatment of malocclusions with which they are seen to occur.

Orthodontic doctrines or philosophies are many; they are all valuable in varying degree in establishing an attitude or an approach to orthodontic problems—within limits. The most serious criticism of orthodontic doctrines is that the limits within which they are valid are seldom defined. The enthusiasm and single-mindedness of the evangelist leads him to override and brush aside limitations and discrepancies in the heat and excitement of establishing his central theme.

The best evidence of the difficulty of formulating a comprehensive orthodontic doctrine is the "compromise case."[31]

The compromise case is one which fits no doctrine or classification and which is complicated by the most aggravating circumstances—early loss of deciduous teeth, overcrowding of the grossest kinds, discrepancies in jaw relationship of the most extreme degrees, individual axial inclinations of teeth that confound all previously held ideas on tooth migration, either normal or following the premature loss of teeth of either dentition. The compromise case is the real test of diagnostic ability and treatment and prognostic acumen. The accepted doctrines crumple and fall before such cases. A synthesis of all the observable details of each case with assistance from the orthodontist's clinical experience are needed if the orthodontist is to make the best of the circumstances as he finds them. No laboratory concept can entirely replace first-hand appreciation of the clinical condition and its infinite variabilities.

If orthodontists are too expedient in attributing causes for the great variety of clinical problems that they must solve, it cannot be said that they are actually unaware of the width of the etiological background that they have to take into account. Indeed a few inspired practitioners have entered the biologic field themselves; others have enlisted the aid of the biologic scientist in the study of their problem.

It is of interest, therefore, to consider briefly the approach of one or two such scientists and to see how they view, in the light of their wider biologic knowledge, the narrower field of orthodontics.

THE SCIENTIST AS DOCTRINARIAN

As problems of growth, development, form, and function and of all the aspects of biology that may affect these things, orthodontic problems have indirectly attracted the attention of scientists who do not have any main interest in orthodontics as such but who have become interested in it as a manifestation of the influence of their own sphere of interest on a special aspect of the evolution of the human being.

The approach of the scientist is conditioned by the fact that it is his object in the first place to get at the truth, regardless of its implications or consequences. Questions of expediency or human need must not be allowed to hinder his pursuit of fundamental issues.

The anthropologist describes the phylogenetic stages of the change in proportion between cranial and facial parts in the evolution of man and speculates as to the relative importance of these factors in the production of dental irregularities. In the same way, the possibilities that the ultimate development of the jaws may be affected by climatic conditions, diet, function, or the intermarriage of races with incompatible facial proportions are taken into account. The scientist is cautious and reluctant to apply the results of scientific investigation to clinical problems, and on that point it is clear that he is aware of the difficulties of establishing a connection. In discussing the question of scientific investigation and orthodontic problems, Krogman[23] has said: "I have come to those problems as a growth student who for many years has been far more intrigued with, shall we say, the fundamental principles of growth development rather than the elaboration of those principles into a framework of thought that

looks to their use in therapy . . . I find limitations in my thinking in the latter direction because, not being a therapist, I am not aware of all of the final residual problems that exist in the adjustment between growth and treatment. I can go thus so far in my thinking and you must meet me halfway to round out the picture."

Many biologic scientists who have had contact with dental growth problems and who have become interested in them are aware of their nature, but not all are as perceptive of the peculiar difficulties of the clinical orthodontic problem or of its solution.

In discussing the general nature of retrogression of the face and teeth in man, Hooton[17] concluded that " . . . in some measure modern malocclusion is encouraged, if not actually caused, by defective and arrested growth referable to improper diets, pathologic conditions in the nose and throat, or generally poor health that affects the whole organism. It is then clear that mechanical correction of malocclusions in a person whose whole physiology is subnormal or disturbed can be of little use."

Orthodontists do, of course, realize that the general health of their patients is of the first importance and that when children show evidence of malnutrition or of any pathologic condition their physical condition must be brought under control first of all. There is still, however, some debate as to whether or not irregularity or malocclusion can be referred directly to improper diets, pathologic conditions in the nose and throat, or generally poor health that affects the entire organism,[15, 29] and it by no means follows that orthodontic treatment is impractical for such children because of their poor physical status. The rearrangement of the teeth or, as Hooton suggests, of a reduced number of teeth can usually be carried out for such children and is often the first step in the rehabilitation of the masticatory apparatus. This is a procedure which can lead to progressive improvements in the periodontal, caries, and oral hygiene conditions and can initiate an upward trend in the health and welfare of the patient as a whole.

The orthodontist's difficulties in interpreting fundamental findings in relation to clinical problems have been mentioned; the scientist's attempts to bridge the gap from his side seem also to be beset by similar difficulties. It is always encouraging, however, to find the effort being made and, in particular, to find light being thrown on the actual working of the mechanism which determines tooth arrangement. J. H. Scott, whose work on tooth eruption and skull and jaw development is now well known, has made a tentative advance into the field of applying basic knowledge to orthodontic problems but has come up against the inevitable problem, which is that it is difficult to specify exactly the way in which different arrangements of the teeth arise.

Scott[33] holds the view that: "In orthodontics, the fundamental problem is not one of the relationship between skeletal pattern and muscle action or even in the factors regulating facial growth . . . the proper question is, 'what is the relationship between bone growth and the growth of the tissue of the gums?' The answer lies at the junction of the alveolar bone and gum where the mucoperiosteum is laying down the growing bone."

Few orthodontists who have had to reconcile tooth arrangement of the upper and lower arches where major anteroposterior arch discrepancies exist would agree that, for instance, such dental arch relations were established by alveolar bone growth alone. Every orthodontist can think of cases in which dental arch discrepancy occurred which were not referable entirely to lack or excess of alveolar growth.

The scientist and the clinician adopt or are compelled to adopt basically different approaches to the formulation of orthodontic doctrine.

The scientist must concern himself primarily with the discovery of truth. Scott[33] remarks: "Research is merely the process of obtaining a partial answer to imponderable problems." The idea behind this remark might have been more clearly expressed as follows: "Research is merely the process of obtaining a part of the answer to a complicated problem." If a problem is imponderable, it cannot be estimated and it is unlikely that an attack on any part of it could ever be begun.

The pursuit of this idea leads to the conclusion that the scientist must divide his problem, of whose nature and extent he has some general estimate, into parts and he must ask certain questions in respect of some one part. He must then pursue these questions until answers are found or suggested. The orthodontist, on the contrary, must look at his problem, which is the problem of the patient, as a whole and if he breaks up the clinical problem into parts he must allocate to each part its importance and significance in relation to the whole problem. If he follows the scientific method and pushes one detailed aspect of the clinical problem too hard, a lack of balance in his outlook may result and the solution of the clinical problem begins to appear in the light of the particular aspect of the scientific problem in which he is interested.

Thus, the clinician interested in the hereditary aspects of facial form may see the defects of one generation appearing in the next as the determining factor in the creation of new malocclusions. He who is aware of the influence that function has on form may translate from a field embracing the widest aspects of human activity to the smaller field of the human face the determining influences of function in creating the shape and relationship of the dental arches. The student of human behavior sees in the mode of development of human activities from the earliest age, partly instinctive in the developing mind and nervous system and partly in reaction to the environment in which the individual lives, the same processes at work in the area of the developing, functioning dentofacial complex, and he sees these processes as primary in the development of malocclusion. The student of growth sees malocclusion as a problem of growth and development of bone.

To the orthodontist, the detail problems of malocclusion appear many-sided and complex. They are not susceptible of simple and straightforward explanations. The scientist can, and indeed must, narrow and simplify his field and thereby find "a partial answer to the imponderable problem." The recognition of the fact that the whole problem is large and in many of its aspects perhaps imponderable should go some way to saving him from reaching the unhappy

conclusion arrived at by Scott,[34] that "the only real complexity in orthodontics resides in the jargon and confusion of mind which orthodontists create for themselves."

This is altogether too jaundiced a view of orthodontic doctrine as formulated by orthodontists. It does, however, reinforce the present belief that it is beneficial for the clinician to return at some time for an independent venture into basic science, not only in the hope that he may make a contribution to our knowledge but also in the hope that the habits of thought formed during that venture may equip him better to appraise the problems of the clinical field and not to be deceived in the future by the appearance of things.

The genuine complexity of orthodontic problems taxes daily the judgment of the clinician if he is to do the best possible in every case. The temptation to fall back on rules and systems devised to smooth out the differences between cases and remove the need to consider the great variety of factors that determine final decisions on treatment is great.

DOCTRINE AND TREATMENT

In interpreting his doctrine in relation to treatment problems, the orthodontist often has to decide what is enough for his patient. Dentally and orthodontically, treatment to the limits of theoretical possibility may involve more than oral hygiene, the condition of the teeth and of the periodontal tissues, can stand and, from the social and economic point of view, more than the patient is prepared to tolerate in terms of time and cooperation.

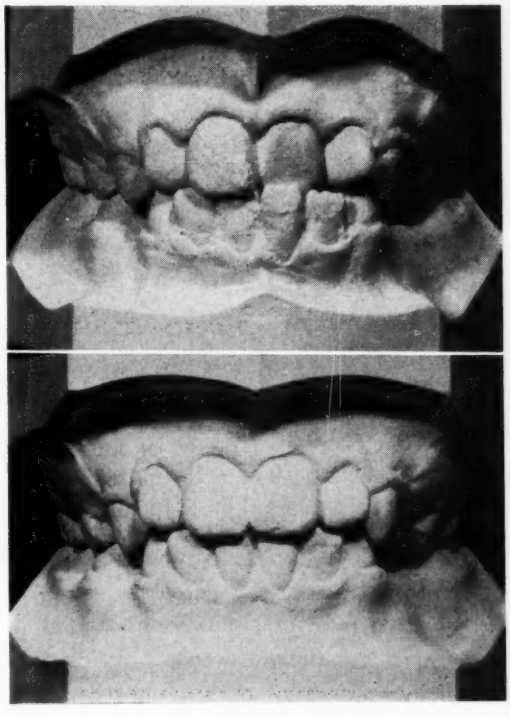
The orthodontist, therefore, must approach his problem with a mind versed in the doctrinal background of his subject but with a flexibility that will interpret those doctrines in relation to the situation as he finds it and with a reluctance to classify his problems too narrowly.

He must also have at his command a technical armamentarium that is ready for any treatment situation. There is a tendency to specialize in technical treatment methods, and frequently we see various appliance systems urged as the universal answer to all treatment problems. This tendency arises from two main sources—problems again of teaching and the human tendency to cling to what one knows. The mechanics of tooth movement are not simple, and the beginner cannot fully grasp them from books or even from demonstrations; he will gain a true appreciation of them only after spending some time in clinical experience and practice. It is, however, necessary, for reasons of time, to limit the range of technique for students, undergraduate or postgraduate, so that what is taught is learned thoroughly. Now where choice and limitation are compulsory, it always seems that emphasis is placed first on fixed appliance methods, perhaps because by these methods any and all tooth movements can be carried out, but also because there is a feeling that orthodontic treatment means treatment with fixed appliances. This idea is rooted in the history of the specialty of orthodontics.

Early orthodontic appliances were, by modern standards, crude things. Whether the first appliance was fixed or removable is hard to say, but it does

seem certain that at the beginning fixed appliances could be relied upon to move teeth whereas the removable type might or might not. At any rate, there seems to have been no doubt in the minds of those whose object it was to move teeth that fixed appliances could be relied upon to do what was aimed at. Thus, among specialist orthodontists, it was on the development of fixed appliance methods that interest centered and on which time and energy were spent. This specialization in technique reached its culmination when the edgewise arch, the most comprehensive mechanism for the readjustment of tooth position, was evolved. In the armaments race of orthodontics, removable appliance methods were left far behind and the fixed appliance became the hallmark, the cachet, of the specialist.

A.



B.

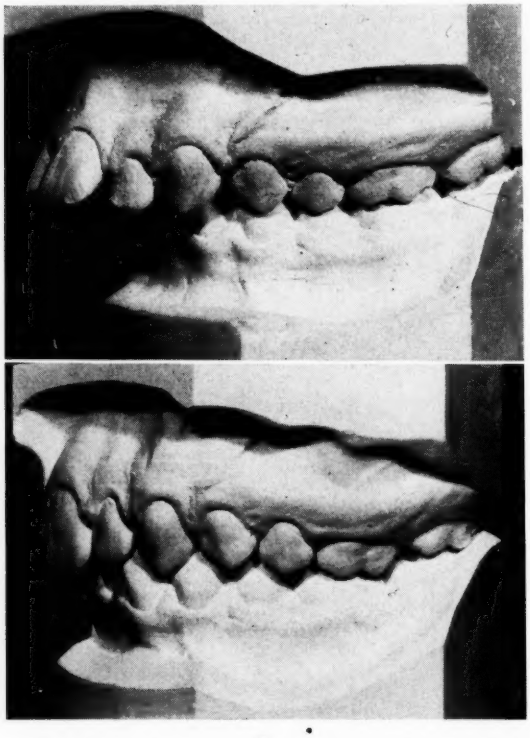
Fig. 6.—At this stage of development, when the patient was 9 years of age, all that was required was the proclination of the upper left incisors into correct relationship with the lower incisors. This was simply effected by the use of a removable appliance.

It is, indeed, unfortunate that the technical aspects of orthodontics should thus have come to bulk so large and that artificial barriers between various appliance technologies have come into existence. While fixed and multiband appliances are well suited for some of the major reconstructions of the denture, for many of the smaller tooth movements and for some of the larger treatment plans, much simpler mechanical means are available and are more suitable. These should be more generally understood and used (Figs. 6 and 7).

The removable appliances of today are very different from those of twenty years ago, and they owe their present versatility to the application of principles that have been described in our literature for some time.

In 1923, G. B. Crozat[12, 13] brought his appliance method to the attention of the orthodontic world. Although his appliances met with limited interest, it seems clear that the clasping method used was new and more efficient than previous ones and that the design and construction of the clasps themselves,

A.



B.

Fig. 7.—A well-defined Class II, Division 1 malocclusion in a 13-year-old patient with concomitant discrepancy in facial form. Removal of the upper second molars and distal movement of the upper dental arch by means of extraoral traction with removable appliances has produced a satisfactory and stable functional and esthetic result. The lower third molars were impacted and these were removed when the patient was 16 years old. This case illustrates the point that as much depends on the basic treatability of the condition in question as on the nature of the appliance used in treatment.

although complicated, was a significant improvement over the methods used up to that time. To this day, in spite of the complications of construction involved, the Crozat method has its adherents. Modern materials and methods of clasp design using the basic Crozat principle have greatly improved the efficiency of removable appliances and extended their scope.

In 1928 McKeag[26] discussed the action and design of orthodontic springs, basing his approach on accepted engineering principles and generally available knowledge of the behavior of metals under stress. The ideas expressed in his paper are as valid today as they were in 1928, and they explain the action of springs of almost every type used in appliance construction, not excepting the

flexible arch appliances fixed to attachments on bands. Indeed, in this connection, McKeag's paper has particular relevance. If, in conjunction with the principles of efficient clasp and spring design, it is realized that springs applied to teeth without the aid of bands must press on smooth and frictionless surfaces and that no grip is obtainable unless teeth are actually banded, the action of removable appliances can be more readily understood.[1]

It is a mistake to think of removable appliance methods as usurpers of fixed methods or as substitutes in any way. The underlying purpose in both methods is to apply pressure to teeth with the aim of causing their movement. It is also a mistake to imagine that a lesser degree of technical accuracy is needed in the construction and use of removable appliances. Unless the orthodontist is in touch with the design, construction, and use of his appliances at every stage, uncertainties of all kinds will enter into any treatment plan and its progress. This essential need for accuracy and the fact that orthodontics is based on an understanding of growth, development, and function militate against the idea that removable appliance methods throw open an unlimited field for a widespread extension of orthodontic treatment in any community.

A perceptive application of removable appliance methods will simplify and expedite many treatment procedures. As in all orthodontic rationales, however, the overenthusiastic extension of removable appliance rationale beyond its natural limitations brings the disappointments of failure in the achievement of treatment aims. To go yet further and base a doctrine on a mechanical treatment system and link the two indissolubly together ties the mind and the imagination into a strait jacket from which they may never struggle free and inhibits the further development of that reciprocity between science and practice on which the future advance of our subject depends.

In the formulation of an orthodontic doctrine continual reference must be made to the established knowledge of the scientific field, and the observations and experience of the clinic must be reconciled with these facts as far as this can be done. When no such reconciliation can at once be made, the scientist and the clinician face each other across a gulf of ignorance which must be slowly filled in by the accumulation of facts and cemented over a period of time with the wisdom of enlightened interpretation to build a road over which the scientist and the practitioner may safely travel to meet, to exchange their viewpoints, and to enter into each others fields of thought and activity.

I wish to thank Dr. B. Holly Broadbent, Dr. Allan G. Brodie, Professor Arne Björk, and the General Dental Council for their kindness in allowing me to make use of illustrations from their publications and Mr. H. T. A. McKeag for reading this paper and for his helpful comments.

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THE CHALLENGE OF CLASS II, DIVISION 1 MALOCCLUSION

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IT IS important for the orthodontist to have a proper concept of what a mouth ought to be, of what it ought to do, and of how it ought to look. In fact, we all have some idea of what a Class II, Division 1 case is, although we have been troubled with all sorts of artificial classifications of malocclusion. Angle's classification is very artificial, and it is based upon the three different ways the upper and lower first molars may be intercusped. Simon made a more thorough study of malocclusion from the standpoint of variations, and to some extent his classification is based upon anthropology. The profession, however, did not much appreciate his classification. We may say that all classifications are artificial, that they are just made to fit the mind of man. This is true in botany, in zoology, in bacteriology, and in all the other sciences. We know well how biologists crave a natural classification, but they have never found one. The elements may be conveniently, but not accurately, classified according to their true nature. We can learn, however, to identify them. In spite of its artificiality, Angle's classification is widely used. It does convey a picture of conditions of a Class II case in such a way as to make a very superficial diagnosis possible. The different forms are similar, so that their treatment can be discussed as if they did make a true group. The same can be said of Class III cases. It is Class I, the great unclassified group, that is truly chaotic.

The mesiodistal disturbances in the interlocking of the cusps is a definite symptom in Class II malocclusion. The recognition of this disturbance and the desire to treat it have led orthodontists to correct it mesiodistally instead of just laterally by expansion, as they did in the past. Of course, we know that this anteroposterior disturbance in a Class II case is just one of the symptoms that accompany and define this peculiar form of malocclusion. Symptoms are so numerous and the variations are so wide that it would seem unwise to mention some of them and ignore others that are equally important. It is enough to emphasize that in a mesiodistal tooth malrelation, mainly in a Class II case, there are infinite variations of different symptoms which have only the distal tooth relationship in common. Orthodontists have also noticed that only when this anteroposterior symptom is properly corrected are they successful in achieving the other aims of treatment: adjustment of the perverted muscular function, correction of excessive overbite and overjet, the axial inclination of teeth, the rotations, the curve of Spee, and so on.

Presented at the Annual Meeting of the American Association of Orthodontists in Washington, D. C., April 28, 1960.

In the past, we judged the jaws as being too far forward or too far rearward solely by our esthetic taste. There was then a division of opinion as to whether in Class II, Division 1 malocclusion the maxilla was too far forward in the face or the mandible was too far backward. Although we claim nowadays to be able to measure the anteroposterior growth deviation by using facial planes associated with anatomic landmarks and with the structure of the cranial base that can be established by the use of x-rays, the matter is still controversial. The majority of patients afflicted with this type of tooth misfit would be regarded by those orthodontists as having retrognathic mandibles. On the other hand, these same cephalometric-guided orthodontists believe that the Class II, Division 1 malocclusions which present a large negative value for the AB-facial plane angle of Downs have protrusive upper denture bases. This is just one example to show that it is patent from the outset that the very concept of the morphology of Class II, Division 1 malocclusion is a challenge even from the cephalometric standpoint. It should be stressed, however, that this division of opinion does not mean that cephalometrics should be abandoned. We firmly believe that cephalometry is here to stay and to be developed.

The much-used headplates on which cephalometric measurements are taken can lead us to a quick assessment of the anteroposterior variations of the maxilla, since the maxilla is rigidly fixed to the cranium even though very recently we have been told that the well-known point A which we pick on the maxilla to signify the maxillary apical base is not even on basal bone but on a continuation of the ridge that runs downward from the anterior nasal spine to the alveolar crest. The actual point A on the basal bone, then, is somewhat posterior to that labial ridge. However, since the mandible is movable anteroposteriorly between an anterior and a posterior terminal hinge opening-closing relationship, the cephalometrists have not yet reached an agreement as to just where the mandible should be in its condylar slot of actions before measurements are begun or before the headplate is taken. Some orthodontists have not yet considered the compelling tooth prematurities that force the mandible to a forward or a lateral occlusal position as malocclusion teeth. They still think that it is all right for the teeth to guide the mandible to its final closure. Once some believed that they could habituate a mandibular forward position and that this would correct a retrognathic mandible. Recently we have been told in great detail about the neuromuscular mechanism of mandibular posture. This has encouraged some to believe that, if we have proprioceptors in the periodontium and alert muscles and if they have good "memories," even if the treatment is inadequate, these good "magicians" will complete the work and compensate for our insufficiencies. As long as we are not sure of just where the mandible should be when the headplate is taken, and as long as we have not agreed as to just where the mandible should be in the occlusal position, how can we agree on the extent of the malocclusion? Hence, the question of how much malocclusion is present in Class II cases remains a challenge and accounts for our present mental turmoil.

There is no clear demarcation between Class II and Class I malocclusion forms. Many of the Class I types have facial and cranial features that would

indicate, on superficial examination, a Class II malocclusion. After a few weeks of treatment, however, many of these pseudo-Class I cases can be definitely assigned to Class II, and if we were not aware of the fact that we had depressed the prematurities we would have reason to think that our treatment had made the malocclusion worse. Hence, many Class I types of malocclusion that apparently resemble a Class II malocclusion must be suspected of being Class II cases until proven otherwise. Some forms are judged to be Class I from the aspect of the molar region, but by the time we reach the canines and the incisors, we can see even with the naked eye that they are distinctly related to Class II malocclusion. In fact, from cephalometric data and from plain casts, the challenge lies in telling when and where Class II begins and Class I leaves off.

Orthodontists have not yet agreed on the causes of Class II malocclusion, any more than Tolstoy's three muzhiks had agreed as to why the Czar's locomotive ran. With the data that we have, we would get lost in a philosophical storm of controversy if we were to discuss the etiology of Class II malocclusion. Yet, the great categories of cause in the developing of malocclusions are fewer than those that confronted Tolstoy's peasants. Their compass of causes included "devils, wheels, puffs, and fire." The compass of causes of malocclusion has just two categories—*environment* and *heredity*. We may be sure that it will be a long time before we do anything to control human heredity. We may control to some extent the environmental factors to offset the trends of heredity, but social opposition and the eventual conflict between parents and doctors and the problematic cooperation from pediatricians will lead to a struggle.

Since we are not sure what constitutes Class II malocclusion morphologically—whether it is in the individual bones of the cranium and of the face or whether it is in the relationship of these bones to each other—we are on shaky ground for making classifications. Since we have not agreed on what causes these forms of malocclusion and the course of their malgrowth directions, it would seem that we would not know how to treat them. Historically, however, therapy began before diagnosis. In the treatment of Class II malocclusion we used to assume that the lower jaw was too far back or that the upper jaw was too far forward. Then we applied a retracting force upon the upper arch and a protrusive one upon the lower arch. Until external anchorage was revived, we used mass maxillary anchorage against mass mandibular anchorage or mandibular mass anchorage against sectional maxillary anchorage. We treated inadequately the anteroposterior discrepancies and by myotherapy encouraged the patient to acquire a protrusive closure to help us "fudge" our difficulties.

From Kingsley's time until now men of experience have advised us to treat thoroughly and to retain adequately. There seems to be no substitute for thorough treatment, even though wrongly conceived, in both the primary and the secondary stages. The teeth must be fitted well together in the arch and between the arches, and then they should be held until stability is assured. Those who realize that their treatment is toward the back to inhibit the maxillary portions of the face and to "let grow" the mandibular portions justify their treatment by claiming that the face is subject to great growth variations,

whether from genetic sources or environmental stimuli, and as long as the variations of the jaws agree in position and in function the mouth will serve its purposes.

In Europe, the Andresen appliances and similar tools are used to compel forward closure mechanically in the hope that satisfactory anteroposterior adjustment will take place. Indeed, it would be nice if we obtained that permanent adaptation from such therapy!

The great stimulus to further effort today in treating Class II malocclusion is that every now and then we have what we and our patients regard as outstanding successes, so that years after retention has ceased, the teeth will interdigitate in jaw posteriority and all the teeth occlude as we believe they should. If we were never encouraged by these successes, we would give up treatment and try to find a way to produce babies who would not develop such deformations. These cruel successes persuade us to continue and give us perennial hopes that ultimately we will be more successful in the majority of cases that we treat.

Nowadays, no matter what methods we use in the treatment of Class II malocclusion, their rationality can be challenged. Using external appliances to retract the maxillary teeth, but without using intraoral Class II elastic ligatures, we begin therapy as if the maxillary arch were overgrown and must be brought back to meet the mandible which is stationed in its posteriority. We justify retraction of the upper teeth by claiming that we want to hold the upper "horses" back until the lower "team" catches up. We think that we can correct these by changing the direction of facial growth, but the morphology and the direction of facial growth requires us to prove whether what we are doing has any semblance of logic. If the mandible is really retrognathic, why do we not try something to make it grow? We know very well that we are not treating this kind of malocclusion where it needs the most help, that is, in the mandible. It is one thing to withhold the maxillary alveolar bone, but it would be far better if we could learn how to change the direction of the actual mandibular growth rather than to wait passively to take advantage of it when it occurs. Certainly, the immediate need and our greatest problem is to work with the growth of the mandible itself, rather than just with the teeth.

Would it not be more logical to approach the Class II problem by trying to find a way to redirect the growth centers of the mandible, which according to the overwhelming evidence of all investigators is in a posterior or distal position in relation to the cranium, rather than use compressive force on the upper denture, which in some cases may be in a fairly good position? Why do we not try to redirect the condylar growth, to make the ramus get longer, or to make its angle become a bit more obtuse? Still better, if this is needed in the mandible to prevent such malformations, why do we not do something to prevent such development of the mandible altogether?

Equalization of the jaws in Class II malocclusion has always been and still is a challenge to orthodontists. Now that we have a clearer perspective of what still has to be discovered about the etiology and the morphology of a Class II malocclusion and of how much we still have to learn concerning oral physiology,

growth dynamics of Class II deformities, genetics, and other equally important subjects, the time seems ripe for us to investigate new methods of approach to this problem and the advisability of diversifying our lines of study.

Today there is renewed hope that perhaps we can soon find a way to redirect bone growth by new approaches. If we could learn to redirect growth in this way or to reverse it at local levels, we would have attained a power almost divine.

THE RESEARCH WORKSHOP ON CEPHALOMETRICS

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RESEARCH reports should refrain from philosophizing, editorializing, or pontificating. A research report should (1) be brief, of not more than ten to fifteen minutes' duration; (2) state the problem; (3) give the source and type of material and controls used; (4) explain the armamentarium and procedure employed; and (5) give the findings and conclusions. Because of the nature of the report which I have to present, I now find it impossible to follow my own dictates.

This report deals with the collaborative efforts of the forty-five participants in the Second Research Workshop on Roentgenographic Cephalometrics at which I had the privilege of serving as Chairman. THE AMERICAN JOURNAL OF ORTHODONTICS for September, 1959, lists the names of the participants, including the committee, moderators, reporters, and consultants.[1] The Workshop was held on July 7, 8, and 9, 1959, at the Bolton Fund Headquarters, Western Reserve University, Cleveland, Ohio. It was sponsored and financed in part by the American Association of Orthodontists and aided by a grant (D-909) from the National Institutes of Dental Health, United States Public Health Service. This is the first Government grant received by the American Association of Orthodontists.

The participants worked for over a year in preparation for the Workshop. In the time alloted to me I shall attempt to present a topical summary, with my own conclusions, of some of the accomplishments of the Workshop. These accomplishments are contained in the Workshop transactions, covering over 300 pages. A full report now is in the final preparatory stage; when it is published, those interested will be able to study the transactions in detail.

The objectives of the Workshop were to discuss and decide on the following:

1. The relative merits of the different roentgenographic cephalometric analyses that were synthesized at the First Cephalometric Workshop held in March, 1957,[2] and other analyses published elsewhere.[3] This discussion was to include a consideration of landmarks, lines, planes, and angles with respect to the skeletal, profile, and denture sections of the skull.

Read before the Research Session, American Association of Orthodontists in Washington, D. C., April 26, 1960.

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2. The practicability and applicability of so-called "norms" and "standards" evolved by various workers in cephalometrics.
3. An evaluation of the various methods of superimposing serial, lateral, and posteroanterior cephalometric tracings in attempts to increase understanding of growth and development and treatment changes.
4. Equipment and technical requirements for clinical use and research on human subjects and for animal experimentation.
5. Adaptation of roentgenographic cephalometrics to research in other branches of dentistry, medicine, and special education.

The Workshop was organized to determine what we know and to eliminate mutually exclusive conclusions as found in the literature. It did not attempt to tell anyone what he *must* do or what he *must not* do. We tried to determine not *who* is right but, rather, *what* is right. The participants by no means felt that they had the final answers to all questions. All present were unanimous in the conclusion that roentgenographic cephalometrics cannot be used as a sole criterion for establishing etiology, diagnosis, and treatment planning in clinical orthodontics. All were in agreement, however, that, when properly used, cephalometrics is a valuable tool in orthodontics.

Cephalometric landmarks and measure points received extensive consideration. It was concluded that these should have the following attributes:

1. Landmarks should be easily seen on the radiogram, they should be uniform in outline, and they should be easily reproducible.
2. Lines and planes should have significant relationship to the vectors of growth of specific areas of the skull.
3. Landmarks should permit valid quantitative and qualitative measurements of lines and angles projected from them.
4. Measurements should be amenable to statistical analyses.
5. Cephalometric analyses preferably should not require extensive specialized training on the part of clinical orthodontists.

The more variable landmarks as found by the Workshop are (1) Bolton point, (2) basion, (3) porion, (4) pterygomaxillary fissure, (5) orbitale, (6) spheno-occipital snychondrosis, (7) gonion, (8) anterior nasal spine, (9) posterior nasal spine, and (10) points B and A (Fig. 1). The importance of the variability of point A is of special concern (Fig. 2). When the labial alveolar bone covering the roots of the incisors is palpated, Howes pointed out, it becomes obvious that the bone follows the roots with practically uniform thickness up to the apices. The bony prominence seen on the profile radiogram labial to the roots is actually at the midline and does not cover the roots. If we attempt to tip the incisor roots labially through the bony eminence on the outer edge of which we usually locate point A, we would force the apices through the labial plate. Therefore, cephalometric measurements of changes at point A taken from the projecting bony process at the sagittal plane are inaccurate and misleading.

It appears from the foregoing that practically all commonly used landmarks are variable. The answer is: *they are.* The important fact is that some landmarks are less variable than others. Variability of landmarks changes at different periods in the growth cycle, depending on age, sex, maturative status, ethnic origin, and other factors.

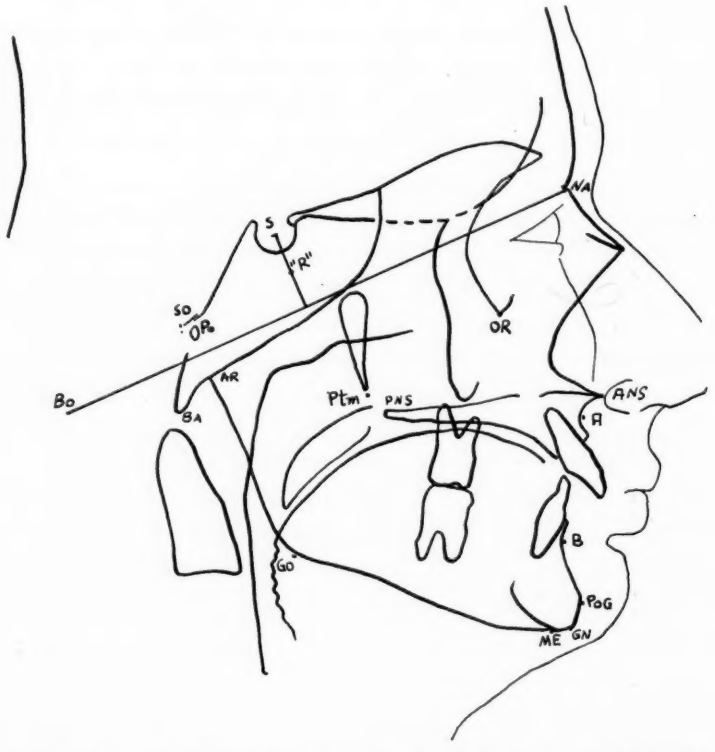

Fig. 1.—Landmarks and measure points approved for use in cephalometrics for clinical analyses. *S,* **Sella turcica;** *SO,* **spheno-occipital synchondrosis;** *Bo,* **Bolton point;** *NA,* **nasion;** *Po,* porion; *"R,"* registration point; *OR,* orbitale; *Ptm,* pterygomaxillary fissure; *PNS,* **posterior nasal spine;** *ANS,* **anterior nasal spine;** *A,* **point A or subspinale;** *B,* **point B or** supramentale; *Pog,* pogonion; *GN,* gnathion; *ME,* menton; *Go,* gonion.

Sella, which has long been considered one of the most stable landmarks, was shown by Björk[4] to be variable. Baume[5] presents the following conclusions on the variability of sella:

> The position of the Sella and any other superstructure of the cranial base is determined by the growth pattern of the investing organ, namely, the brain stem with its adhering pituitary gland. Caught by the growth momentum of the supporting cranial base and the investing pituitary gland, the Sella can by no means be considered a stable point of reference in growth studies.... The position of the Sella relative to the cranial base, therefore, may be compared with a drifting boat on a river.

The impasse precipitated by the question of variability of landmarks was resolved largely by Stanley M. Garn, head of the Study of Human Development, Fels Research Institute, Antioch College, Yellow Springs, Ohio, who served as a special consultant to the Workshop. Dr. Garn presented the following premise:

In the growing organism, there is no such thing as a "fixed point" except that the origin for a given measurement is arbitrarily defined as zero. While there may be less change in structures nearer the base of the brain, and while these structures may be useful for measuring the movement of other points, they *do* also change. The "stability" of lines of reference is extraordinarily difficult to prove in a growing system, but it is possible to measure change of one line in reference to another. No reference to a change is acceptable without a definition of the base from which the measurements are made. It must be recognized that this base of reference may also undergo changes. The tendency to talk about "vertical" growth or "horizontal" growth does not refer to changes in size of particular structures but merely to the system of coordinates established for the study. There is no *a priori* reason why one definable and anatomically meaningful supreme or point is "better" than another except by demonstration in a given diagnostic situation. Of paramount importance is the usefulness of the criterion.

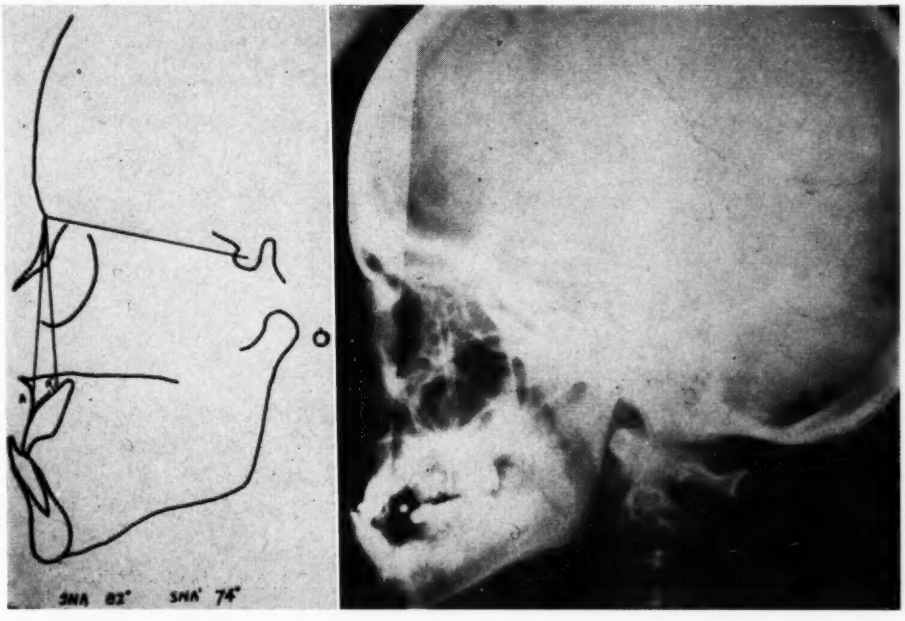

Fig. 2.—Variation of location of point A (see text). (From Howes, Ashley E.: To be published in the Workshop *Transactions*).

The foregoing presents a new base for future research in systems of roentgenographic cephalometric analyses. Hrdlička[6] long ago pointed out that anyone can establish his own reference points. The important thing is that such points must be carefully defined so that they can be reproduced and verified by other workers.

Various planes were discussed. The three possible planes of reference at the base of the cranium accepted by the Workshop are the Broadbent-Bolton plane (Bolton point-nasion), the sella-nasion plane and the SO-N (spheno-occipital synchondrosis-nasion plane). The Frankfort horizontal also was considered "useful" as a base plane because of its close relation to the cranial base. The Broadbent-Bolton construction, using "R" point, is considered the most reliable for serial growth studies and for recording dentofacial changes over any appreciable length of time (Fig. 3).

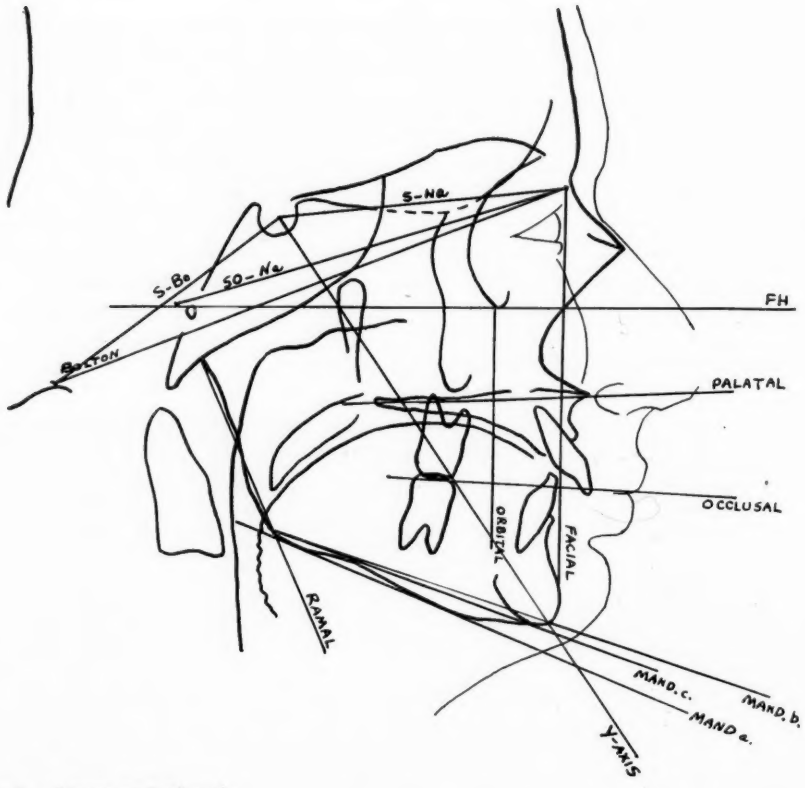

Fig. 3.—Lines and planes.

Cranial base planes: Sella-nasion *(S-Na)*, Bolton plane-nasion *(B-Na)*, spheno-occipital suture-nasion *(SO-Na)*, Frankfort horizontal *(PO-OR)*.

Facial planes: Palatal, occlusal, and mandibular planes; also facial plane. Y axis, orbital plane, and ramus plane. In clinical analyses, the orbital plane and the ramus plane are seldom used.

Mandibular planes: Tangent to base (lower border) of the body of the mandible; gonion-gnathion; and gonion-menton.

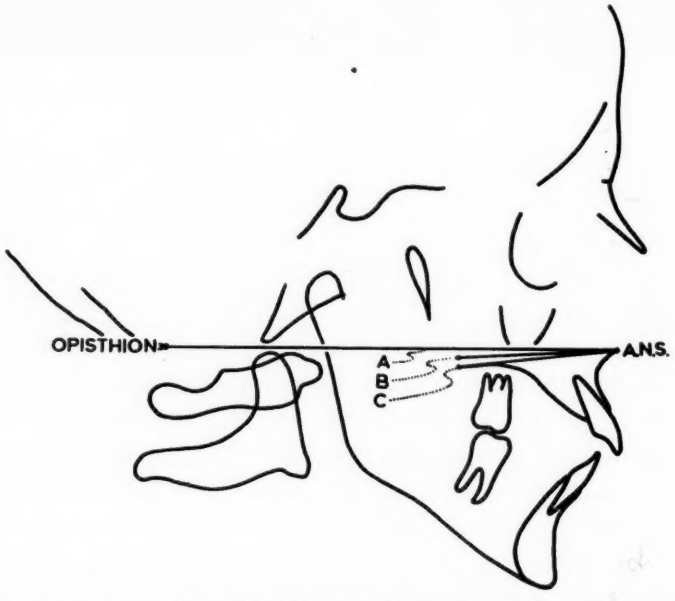

Fig. 4.—Palatal plane may or may not coincide with ANS-opisthion. (From Moorrees, Coenraad F. A.: To be published in the Workshop *Transactions.*)

Three planes in the face that are considered useful are (1) the palatal plane, joining ANS and PNS, (2) the occlusal plane which bisects the first molar and incisor overbite, and (3) the mandibular plane (Fig. 3). It should be kept in mind, however, that ANS and PNS are considered difficult to locate with any degree of accuracy. Furthermore, the ANS-basion and the ANS-opisthion planes may or may not coincide with the palatal plane (Fig. 4).

The mandibular plane has been variously constructed by different cephalometrists (Fig. 3). The Workshop accepted the following:

1. Tangent to the lower border of the mandible. However, variability of the outline of the lower border of the mandible, especially when the antegonial notch is extremely pronounced or when the border shows a decided outward curvature, makes this construction a highly questionable one.
2. Joining gonion and gnathion. Both of these points are variable.
3. A plane joining gonion and menton, both of which show variability.

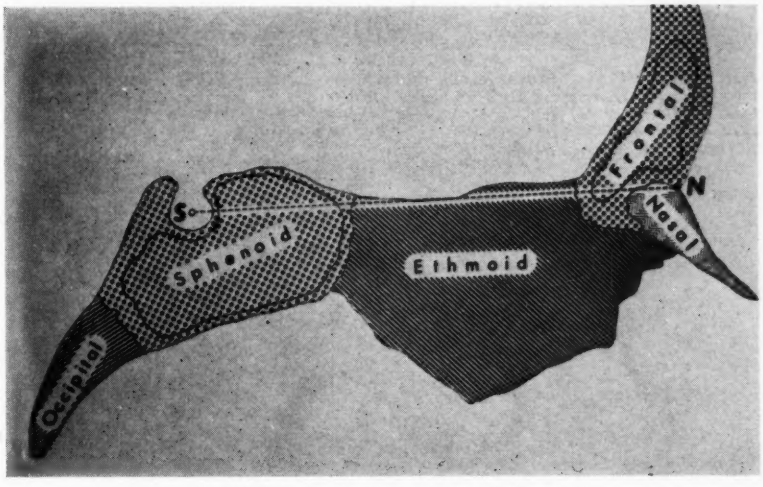

Fig. 5.—Sagittal section showing contributing structures in the line connecting sella and nasion (*S-N* line) (see text). (From Thurow, Raymond C.: To be published in the Workshop *Transactions.*)

Consistency in the use of the mandibular plane chosen for any cephalometric analysis, or for a research project, is imperative.

The Downs "Y" axis is useful in measuring an angle formed with one of the cranial base planes. The facial plane, joining nasion and pogonion, also is considered useful. It provides a base for measuring the relative protrusion or retrusion of the dentition in the facial profile. Both nasion and pogonion, however, show variability during growth (Fig. 3).

Many of the lines and planes of measurements extend across areas to which various craniofacial bones contribute (Fig. 5). For example, the sella-nasion plane which is popular in cephalometric analyses used by orthodontists extends across the sphenoid, ethmoid, frontal, and nasal bones. Sella itself is considered a superstructure of the sphenoid bone and is actually above the

cranial base.[5] The part of the frontal bone involved and the nasal bones are not even part of the basicranium, as Moss pointed out (Fig. 6). Each of these bones undergoes independent developmental growth changes. Other lines may extend from lateral to sagittal points on the skull, thus making them highly variable and unreliable.

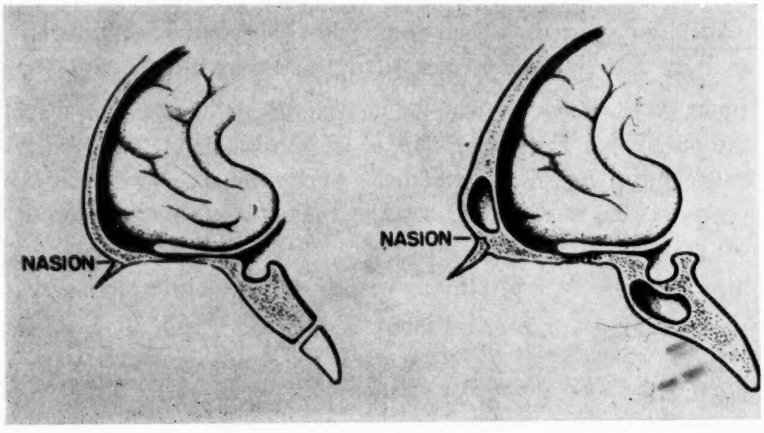

Fig. 6.—Nasion, as a craniometric point, is functionally related to the *ectocranial* table of the calvaria. It may alter both its vertical and horizontal positions in space with growth. These shifts occur without concurrent *endocranial* changes in the skull base whose anterior cerebral fossa contours are relatively fixed after the age of 3 years. (From Moss, Melvin L.: To be published in the Workshop *Transactions.*)

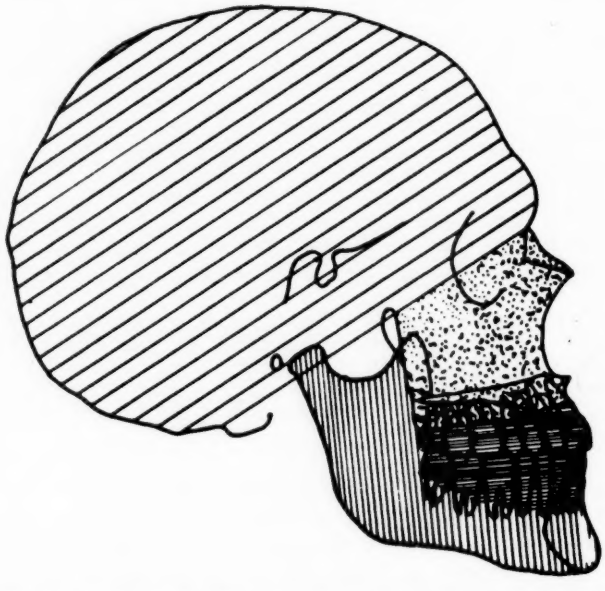

Fig. 7.—Tracing by Downs showing cranial base, basal maxillary, and mandibular bony areas, and the alveolar bone. Only the alveolar bone appears to be under the direct influence of the orthodontists. (From Downs, William B.: AM J.ORTHODONTICS, 34: 812-840, 1948.)

Three components accepted as necessary in a cephalometric analysis are[7] (1) skeletal analysis, (2) profile analysis, and (3) denture analysis (Fig. 7) (all propounded by Downs).

1. *Skeletal analysis* (Fig. 8) has for its major purpose recognition of facial type and an appraisal of anteroposterior apical base relationship, particularly important in Class II and Class III (Angle) malocclusions.

2. *Profile analysis* is primarily an appraisal of soft-tissue adaptation to the bony profile. However, it was recognized that certain skeletal angular criteria, the amount of tonicity of the soft tissues, and facial muscular posture can influence the appraisal of the profile. This analysis is far from settled (Fig. 9).

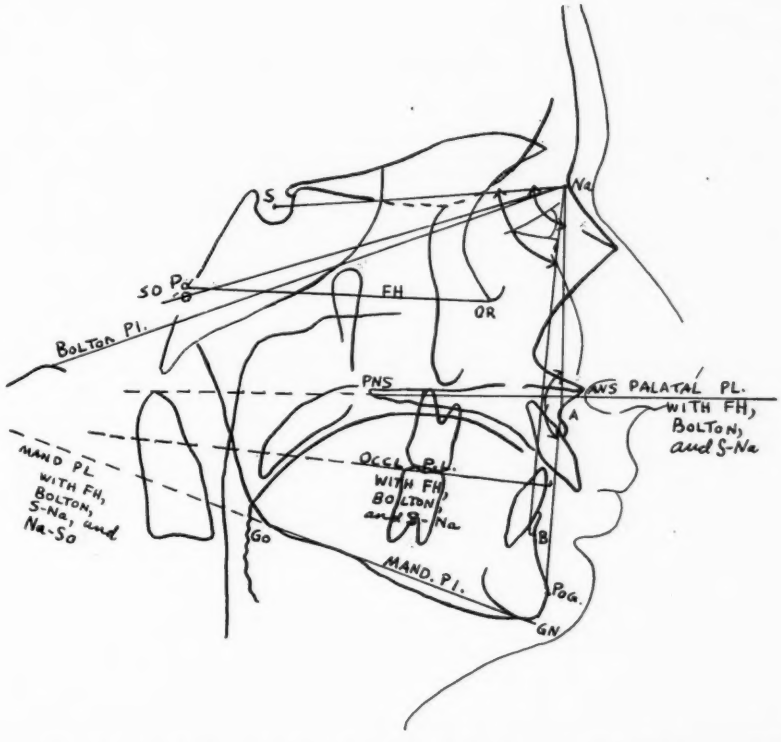

Fig. 8.—Skeletal analysis. Angles *S-Na-A*, *S-Na-B*, and the difference between them for anteroposterior apical base appraisal. (Downs' facial angle, *FH-Na-Pog*, fits into this group.) *NA-A-POG* angle. Palatal, occlusal, and mandibular plane angles may be related with any of the base planes.

3. *Denture analysis* consists primarily of an appraisal of the relationships of the maxillary and mandibular dentitions to each other and to their respective bony bases. The relation of the axial inclination of the maxillary incisors with any of the four possible cranial bases, the relation of the mandibular incisors with one of the mandibular planes and/or with Frankfort plane, the relation of the maxillary and mandibular incisors to each other, and the linear measurement of the maxillary incisors in anteroposterior position with respect to the facial plane all enter into denture analyses (Fig. 10).

All three analyses—skeletal, profile, and denture—have to be integrated with each other and weighted with other diagnostic aids for clinical purposes in orthodontic practice. These aids include the following:

1. General medical history
2. Gross clinical examination of the patient
3. Intraoral radiograms
4. Lateral-jaw and other special radiographic projections (cephalometrically oriented views taken at 45 degrees to the posteroanterior orientation are preferable to conventional lateral-jaw views)
5. Plaster casts
6. Photographs
7. Additional cephalometric records for dynamic or functional analyses or other special purposes such as
   (a) Postural rest position of the mandible
   (b) Phonation positions of the mandible
   (c) Wide-open mouth views
   (d) Views with radiopaquing media

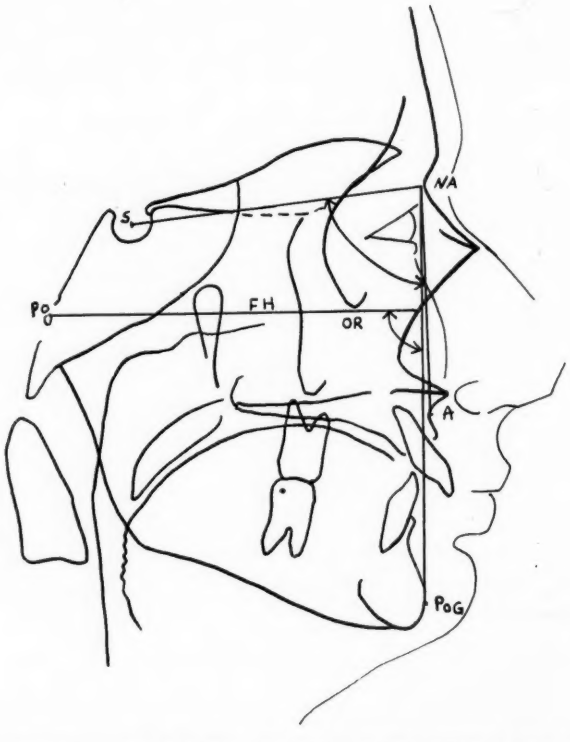

Fig. 9.—Profile criteria. *FH-NA-Pog* (Downs' facial angle) for anteroposterior mandibular appraisal. *S-NA-A* for anteroposterior maxillary appraisal. Size and shape of nose; thickness, length, and posture of lips; morphology of tissue over mandibular symphysis, etc.

The value of the above supplementary records depends on the nature of the problem under study.

The standarized registrations of the head, in spite of unresolved variation of landmarks and shortcomings in planes, lines, and angles as visualized in the lateral and posteroanterior cephalometric radiogram were found to provide an excellent medium for the study of the patient throughout the period of growth

and development and for appraisal of changes brought about by orthodontic ministrations. However, cephalometrics is of value only in so far as it is applied in a manner which takes cognizance of its limitations along with its advantages. Limitations are common to all cephalometric techniques.

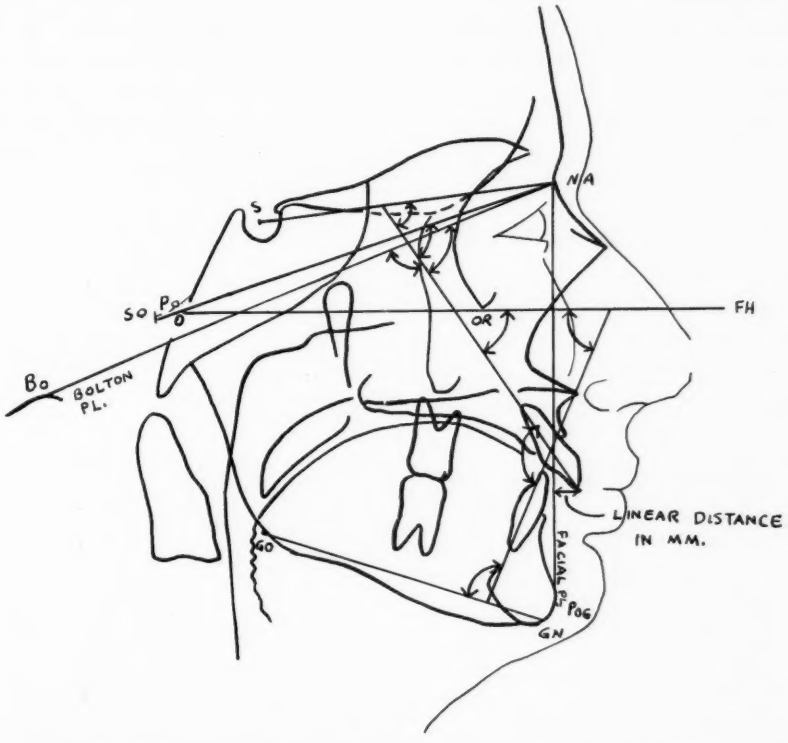

Fig. 10.—Denture criteria. Inclination of mandibular incisors with mandibular plane or Frankfort plane. Maxillary and mandibular incisor long axis angle. Maxillary incisor long axis angle with any one of the four basal planes. Linear distance, in millimeters, of maxillary incisor tip from facial *(NA-Pog.)* plane.

Standardization of all possible variables in taking cephalometric radiograms is important. Hallett[8] has presented an interesting study entitled "Inherent Errors in Cephalometric Films and Their Reproduction." Those variables not subject to standardization should be clarified, their effects on the findings should be stated, and their effects on the findings should be explained in published articles. Factors which contribute to variability in cephalometrics include the following:

1. Variation in intervals between observations (intervals should be kept constant)
2. Enlargement and distortion due to lack of standardization of the distances between target, subject, and film
3. Variation in positioning of the patient (it was advocated that the left side should be next to the cassette for profile projections)
4. Lack of consistent occlusal relationships and postural relationships of the head

Prediction of growth and development of the dentofacial complex in the child from serial cephalometric records at its present stage did not meet with universal acceptance at the Workshop. Predictions may consider growth per se or growth as it is influenced by treatment or by other factors. The Workshop felt that present knowledge permits only imperfect predictions. Ricketts presented the valid statement that by the very act of undertaking treatment of patients the orthodontist engages in prediction. To this I may add that such prediction is usually based on various diagnostic aids and clinical experience. Unfortunately, it is also based occasionally on wishful thinking and on the "system" of appliance therapy to which the individual orthodontist subscribes.

The Workshop concluded that serial cephalometric records *could* be used to determine a pattern which *may* be projected into the future, but it must be recognized that such a pattern may change at any time, either through growth progress or as a result of the influence of orthodontic therapy. Any estimation or prediction of future dentofacial development, according to the Workshop, must consider the areas, increments, vectors, duration, and timing of growth.

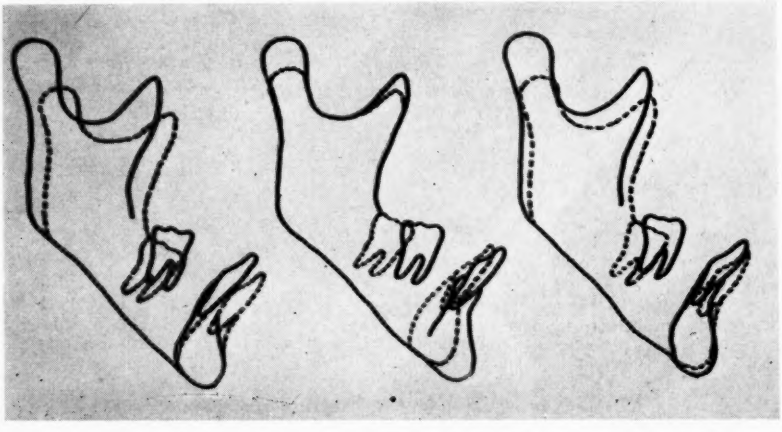

Fig. 11.—Superimposed tracings of the mandible in a case with a typical growth and development, showing changes due to growth and resorption in the chin region in a boy at the age of 10 years (dotted lines) and after treatment at the age of 16 years (solid lines). *A*, Mandibles superposed on gnathion and lower border. *B*, Superposed on posterior border of ramus and lower border of mandible. *C*, Superposed on inner table of chin and lower border of mandible. (*Note:* Only *C* gives an accurate picture of the change that actually took place.) (From Adams, J. William: To be published in the Workshop *Transactions*).

In addition, we have to consider additional intrinsic and extrinsic, systemic, local, and environmental influences. Growth estimation or prediction is of great value to the orthodontist and deserves further study.

The question of superposition of roentgenographic cephalometric tracings to determine growth increments and changes due to orthodontic therapy were discussed. Probably no manner of superposition is utterly worthless, and certainly none can be regarded as absolutely accurate. In the early years of generalized growth in the child, when all free surfaces may be undergoing growth changes, superposition can provide only qualitative impressions of "how things are going." Later, when craniofacial growth is limited, superposition gains in reliability.

For the evaluation of intramandibular change, superposition upon the symphysis and the lower border of the mandible has long been the method used. As we go posteriorly along the lower border of the mandible, however, reliability decreases. Adams advocated using the inner table of the mandibular symphysis for studying intramandibular changes (Fig. 11). Gonion changes not only through its backward migration but in a vertical and horizontal direction as well. This was demonstrated by Björk,[9] Brodie,[10] and Salzmann and Ast.[11]

Intramaxillary evaluations should rely upon registration on the anterior parts. The superior and inferior surfaces of the hard palate in the region of the anterior nasal spine are useful, but ANS itself should always be suspected since it undergoes appositional growth or may show modification from one radiogram to another.

Techniques for the serial evaluation of orthodontic treatment are not substantially different from those for studying growth. Spatial changes in the dentofacial area due to growth are concurrent with treatment changes during childhood and therefore present difficulties in their individual evaluation. These difficulties diminish (1) when the patient is relatively advanced in years and therefore not experiencing much active growth change, (2) when treatment time is short, and (3) when the treatment consists essentially of shifting individual teeth.

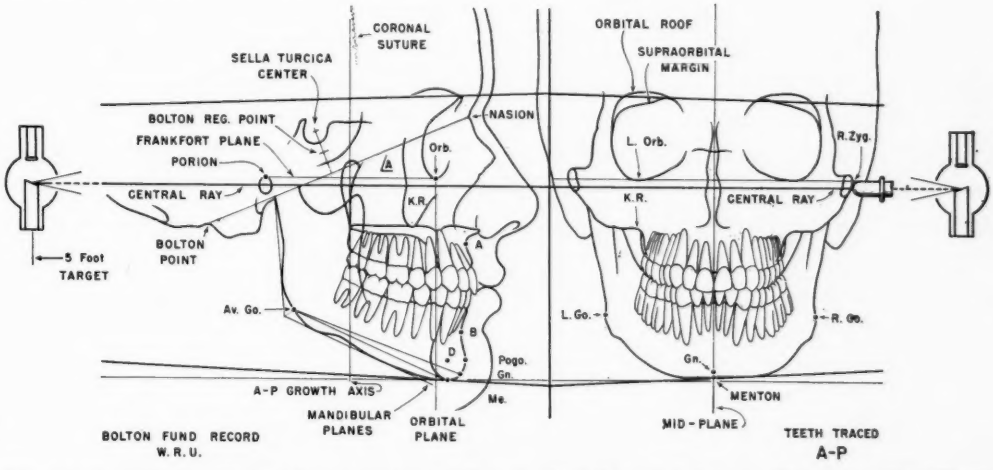

Fig. 12.—Complementary Bolton tracings. For explanation, see text. (Courtesy Broadbent-Bolton Study Anatomical Laboratory, Western Reserve University, Cleveland, Ohio.)

Broadbent advocates the making of complementary tracings of profile and posteroanterior films by placing the films with the profile on the left side facing to the right and the posteroanterior film on the right side of the tracing. With the profile film facing toward the posteroanterior view, the films are attached over the Bolton orientator at the object-film distances from the center of the cephalometer when they were exposed.

Since the x-rays diverge from their source and the object-film distances are not then parallel lines, orthodiagraphic projection of any point from the lateral to the frontal view is inaccurate. The orientator containing the diverging

lines of the path of the x-rays eliminates this inaccuracy and permits the location of indentical points in both views with precision. If uniform cephalometric procedures can be agreed upon and used in reporting growth and clinical data, considerably more helpful information will become available to the orthodontist than has hitherto appeared possible (Fig. 12).

In conclusion, roentgenographic cephalometrics is a descriptive technique which offers potential parameters for quantification. Cephalometrics is limited, however, to the information obtainable in the profile and posteroanterior radiograms. It does not, and cannot be made to, provide information beyond that inherent in the original roentgenographic cephalogram. The employment of cephalometrics in orthodontic practice requires thorough familiarity with the nature, potentialities, limitations, and biologic meaning of the lines and angles that are drawn on the tracing of the cephalogram. Such familiarity requires a knowledge of anatomy, physiology, and pathology as well as clinical experience.[12]

The value of validity of cephalometric findings, whether for research or for clinical purposes, depends on a knowledge of statistics. The research worker and the practicing orthodontist who undertake to present interpretations and conclusions based on cephalometric statistics should have a knowledge of statistical methods. If they do not possess such knowledge, they should obtain the aid of professional statisticians.

What we should aim for in roentgenographic cephalometrics is to obtain valid conclusions based on established covariant parameters in order that we may possess acceptable numerical expressions of the morphologic integration and dynamic changes in the growing skull to aid us in our clinical endeavors.

The highest quality of radiograms, the most accurate tracings, the most thorough collection of lines and angles, the most inclusive system of linear and angular relationships, and the most rigorous statistical techniques are worthless if the clinician or researcher fails to begin with a clear, concise understanding of the problem which confronts him. He must know what he is seeking, what he wants to find out. Cephalometrics is a means of obtaining information; it is not an end in itself.

"Standards" drawn from persons with excellent occlusion have been used as a means of deciding treatment objectives. Such use of statistical analysis has no scientific justification. Morphologic deviation from a mean, however large it may be, cannot per se be looked upon as a condition requiring orthodontic correction. The only thing that one can be certain about with respect to cephalic measurements is that they will vary from patient to patient. Every living being is unique. Therefore, the range of variation is more important than the mean on which so-called "standards" are usually based.

The measurement of man is possible, and much is to be learned from such measurements. We are still far from understanding the full significance, validity, and implications of our measurements.

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654 MADISON AVE.

PROCEEDINGS OF MONDAY LUNCHEON SESSION HONORING FOUNDER MEMBERS OF THE NORTHEASTERN SOCIETY OF ORTHODONTISTS, MARCH 14, 1960

THE Monday luncheon session honoring the two remaining founder members of the Northeastern Society of Orthodontists, held in connection with the Society's annual meeting, convened at 1:30 o'clock (following luncheon) in the Empire Room of the Waldorf-Astoria Hotel in New York City, with Dr. Wilbur J. Prezzano, president of the Society, presiding.

PRESIDENT PREZZANO: We all hope you have had an enjoyable luncheon. Again I greet you, and at this time I would like to present the gentlemen at the dais. We shall ask them to take a bow: On my far right is our very capable secretary, Dr. David Mossberg. Next to him is Dr. Edwin C. Lunsford, one of our panelists for tomorrow, and a very well-known orthodontist. Next to him is Dr. Henry Beebe, our president-elect who has just about twenty-four remaining hours of grace. Next to Dr. Beebe is Dr. L. Bodine Higley, president of the American Board of Orthodontics, and one of our essayists who will address us this afternoon. Next to him is a gentleman whom I think we all know, our good right arm and past president of the American Association of Orthodontists, Dr. Phil Adams. Next is another "unknown," Dr. Lowrie J. Porter, past president of the American Association of Orthodontists and a charter member of this Society. And then we have Dr. George Anderson, president of the American Association of Orthodontists. Here next to me is Dr. Joseph D. Eby, who is our sectional editor and a past president of the American Association of Orthodontists, but those are not the real reasons why he is up here today. On our far left we have our very hard-working vice-president, Dr. Irving Grenadier. Next to him is Dr. Kenneth C. Marshall, one of our speakers of the day, who will address us this afternoon. Then we have Dr. Harold K. Terry, who gave us such a fine talk this morning. Next to him we have Dr. Joseph E. Johnson, past president of the American Association of Orthodontists and our outstanding essayist, who addressed us this morning. Then we have Dr. Stephen C. Hopkins, a good friend and one of our fine morning's essayists and, as I announced this morning when I introduced Dr. Hopkins, also past president of the American Board of Orthodontics. Next to him is Dr. Franklin Squires, past president of the American Association of Orthodontists, whom we shall be calling upon this afternoon. Then next to him is Dr. Leuman M. Waugh, our historian, past president of the American Association of Orthodontists, and many other things, who is also here for another reason.

A minute ago I stated I was going to be calling upon Dr. Squires this afternoon; I meant in a few moments. As you all know, today we are going to take

the opportunity on the occasion of this Society's gathering and luncheon to pay homage to two men who have truly formed the foundation of our Society. They are our founders of longest standing. For this part of the program we are going to ask one of our charter members, Dr. Franklin Squires, to act as Master of Ceremonies.

TOASTMASTER SQUIRES: Today's luncheon is a most happy occasion, and I am deeply grateful to our president, Dr. Prezzano, for the very special privilege of participating in this part of the program.

It is very fitting that this time has been set aside to honor two of the most outstanding and beloved men in orthodontics, Dr. Joseph D. Eby and Dr. Leuman M. Waugh. Both were founders of our Society and, from its inception to this very day, have maintained an undiminished interest in its welfare.

At this time I am going to pause. Dr. Prezzano has already presented the president of the American Association of Orthodontists who is visiting us at this time but who certainly is no stranger to us in the Northeastern; we recognize the fine job he is doing for orthodontics, and we are looking forward to a most promising session that he and his committees have planned for us in Washington just six weeks from now. I want at this time to call on Dr. George Anderson for a few remarks.

DR. ANDERSON: Dr. Squires, Dr. Prezzano, Dr. Eby, Dr. Waugh, Members of the Association, and Guests: Please don't think the brevity of my remarks regarding the American Association of Orthodontists and its activities or of the coming meeting in Washington is any evidence of a lack of desire on my part to tell you further of the affairs of the Association and what we plan for you, but I came here for an entirely different purpose. I came here specifically to pay the respects of the American Association of Orthodontists, its officers, its Board, and its committees and members to two distinguished members of this group, Dr. Eby and Dr. Waugh. I informed the other officers of the American Association of Orthodontists that such an honor as this luncheon was to be paid to these two gentlemen, and I am sure they have their good wishes. From the Association and from me personally, I extend to them best wishes for many happy years to be with us, and the greetings and best wishes of our Association.

TOASTMASTER SQUIRES: Thank you very much indeed, Dr. Anderson.

We are also fortunate to have at this luncheon another man who represents a group for which both Dr. Eby and Dr. Waugh have a special bond of affection. He is to be one of our essayists of the afternoon, but I would like to call on him to say a few words at this time—Dr. L. Bodine Higley, president of the American Board of Orthodontics.

DR. HIGLEY: Dr. Squires, Jo, and Leuman: I have always wished I could say something nice about you good men, and this is a little opportunity. As all of you know, both Jo and Leuman were directors of the American Board of Orthodontics for the duration of the time they were supposed to act, both serving as presidents of the American Board of Orthodontics and both contributing a great deal not only to that organization but, of course, to the field of orthodontics at large.

In addition to that, you probably remember that both of them were honored by being recipients of the Ketcham Award, presentation of which is a duty delegated to the American Board, and a very pleasant one indeed to be able to carry out.

So, from the members of the Board who are now active and, I am sure, all of the past directors, Leuman and Jo, it gives me great pleasure to bring greetings.

TOASTMASTER SQUIRES: Thank you very much, Dr. Higley.

I have a letter that was directed to the president which I would like to read at this time:

> In this program I note that you are honoring our great friends, Dr. Joseph D. Eby and Dr. Leuman M. Waugh. To these men goes much credit for the stature of our profession, not only in your area but nation-wide as well.
>
> Will you please extend to Dr. Eby and to Dr. Waugh the felicitations and best wishes of the Secretary of the American Association of Orthodontists and of the Central Office of that organization for which they have done so much.
>
> With kindest personal regards and best wishes for a most successful meeting, I remain
>
> Sincerely,
> */s/ Earl E. Shepard.*

When our Society was 20 years old, Dr. Eby presented a historical review of the first twenty years, and Dr. Waugh gave biographic sketches of the past presidents of the first twenty years. These two articles, together with portraits of the founders and of the first twenty presidents were published in the February, 1941, issue of the JOURNAL. These presentations were painstakingly prepared and bring into focus the events of that initial period of our history. They are typical of the many, many fine things these two men have done for us over the first forty years of our experience. On this occasion time will not permit a similar review of the second twenty years, but as a background it might be interesting to mention briefly some of the facts pertaining to the formation of this Society and also to recognize the charter members who are present at this meeting.

Although the American Society of Orthodontists, which represented a new and growing specialty of dentistry, had been in existence for twenty years, it was felt by some that there was a definite need for a local organization in and around New York. Some sections of the United States had by this time already organized, and others had plans under consideration. Accordingly, in 1921, on the initiative of Dr. Fisher, a group of nine orthodontists practicing in Manhattan entered into a series of informal discussions leading to the formation of the New York Society of Orthodontists. Those of this group who are recorded as our founders are Martin Dewey, Joseph D. Eby, Henry C. Ferris, William C. Fisher, Victor Hugo Jackson, Leuman M. Waugh, C. W. B. Wheeler, and J. Lowe Young —all men of stature.

The organization meeting of the Society was held on Oct. 21, 1921, and the first regular meeting was held on Dec. 8, 1921. As might be expected, both Dr.

Eby and Dr. Waugh were put right to work. Dr. Waugh was appointed chairman of the committee to draw up the constitution and bylaws, and Dr. Eby was made chairman of the Arrangements Committee. There were forty-one members, of whom eight were founders and the others are listed as charter members. Those of the thirty-three charter members who are still in practice are Walter C. Chapin, C. Sterling Conover, Alfred M. Desnoes, Walter H. Ellis, Julius Goldberg, Arthur V. Greenstein, Augustus B. Holt, Lowrie J. Porter, Philip L. Salzberg, and Franklin Squires. If any of those men are here (I know some of them are present), will they please stand at this time and let us see them.

Now what can I say in a few minutes about these two men whom we are honoring today? If I were to attempt a listing of their professional accomplishments and their outstanding contributions to orthodontics, just the reading of this list would more than use up the time allotted to me. However, both are so universally admired and respected, and their professional careers have been so intimately associated with the progress of orthodontics for more than fifty years, that I am sure their achievements are quite well known. I will just mention a few orthodontic highlights: Both of these men were past presidents of this Society, past presidents of the American Association of Orthodontists, and past presidents of the American Board of Orthodontics. Both have received the Ketcham Award, the highest honor within the gift of our specialty, and both have presented innumerable clinics and scientific papers before this Society, the American Association of Orthodontists, and many other organizations. Both were members of the original Orthodontic Advisory Committee appointed by the Commissioner of Health of the State of New York some fifteen years ago, and to this very day both are serving on the Advisory Committee to the New York City Department.

When Dr. David Ast, director of the Bureau of Dentistry of the State Department of Health, learned that this luncheon was to be given in honor of these two men, he requested the privilege of attending and has made the trip from Albany solely for this occasion.

I would like at this point to pause and call on Dr. Ast and to have him say a word or two if he will.

DR. AST: Dr. Squires, it is my privilege and my personal pleasure to be here today and to bring to Dr. Eby and to Dr. Waugh the official greetings of the New York State Department of Health.

I am sure that all of you people here are thoroughly familiar with the orthodontic accomplishments of these men to whom you pay this honor. Not all of you, perhaps, know of the tremendous contribution which these men have made in making possible the rehabilitation of thousands of children in this state who were physically handicapped as a result of severe malocclusion and who today are able to take their places in society. This contribution is one which I would like to call to your attention as I pay my special respects to Dr. Eby and to Dr. Waugh who served on the Advisory Committee which made this program possible in 1944 and 1945.

TOASTMASTER SQUIRES: Thank you very much, Dr. Ast.

Dr. Eby's record during World War I, when he was the first dental officer ever to serve on a major surgical team, is a monumental contribution to our profession. The maxillofacial team of Colonel Robert H. Ivy and Major Joseph D. Eby, which was characterized by the Surgeon General as the best surgical team in the Army, established a most remarkable record. Because of their combined surgical skills and their almost fanatical devotion to the problems that confronted them in each individual case, and because of Dr. Eby's basic orthodontic training, several hundred front-line combat soldiers who had survived facial wounds—many frightfully disfiguring—were rehabilitated and returned to civilian life.

Dr. Pollock quite recently stated that a series of articles by Major Eby appearing in early issues of the AMERICAN JOURNAL OF ORTHODONTICS and various medical journals created a tie-in between orthodontics and maxillofacial surgery and were probably the most valuable contribution that the specialty of orthodontics ever made to real health service. I know Dr. Eby looks upon this service in the Army as three of the most useful and satisfying years of his career.

One of the great loves in Dr. Eby's life is the AMERICAN JOURNAL OF ORTHODONTICS. For more than forty years he has exercised an interest akin to religious ardor in its welfare. No one has served this publication, which is the official organ of the American Association of Orthodontics, with more devotion; nor has anyone except the editor-in-chief given more freely of his time and talents to it. I dare say not a single week goes by but that some correspondence pertaining to the JOURNAL is exchanged between Dr. Eby and Drs. Pollock, Salzmann, Swain, and others.

As some of you know, Dr. Eby is a sentimental individual, and on more than one occasion he has stated that when he is laid to rest it is his desire that a copy of the then current issue of the JOURNAL be placed with him.

Aside from the many offices in this and other professional organizations that Dr. Waugh has held, I believe he is best known to orthodontists as an educator and an administrator. From the day of his graduation from dental college, and I suspect even before graduation, to the time of his retirement, Dr. Waugh was always closely associated with some special educational effort. In Buffalo, where more than fifty years ago he was professor of histology, embryology, and pathology, he is still affectionately remembered and has frequently been called back to give lectures.

Here in New York and in this Society, we all know that Dr. Waugh was professor of orthodontics and director of the Orthodontic Clinic at the College of Dental and Oral Surgery of Columbia University for more than twenty-five years, but I wonder if we realize the great strides that were made in orthodontic education generally during his tenure of office at Columbia and how much of this progress can be attributed to his vision and initiative. During this period the Graduate Division of Orthodontics was organized. This was the first such division under accredited university discipline in America. Also during this period, the first attempt ever made anywhere to conduct university extension courses in orthodontics was undertaken. The first effort was in the nature of a course given at the University by Dr. John V. Mershon. This proved such a

huge success and helped so much to satisfy a definite need and a desire on the part of practicing orthodontists that over the next several years additional courses (I believe fourteen in all) were conducted by Dr. Mershon. These were followed by numerous courses under Dr. Hellman, Dr. Lischer, Dr. Strang, Dr. Johnson, and others. By the time Dr. Waugh relinquished the position of director of the Department, some 500 different practicing orthodontists from all sections of the United States and Canada and five other countries had been enrolled in one or more of the courses. At that time this represented about one-half of the entire membership of the American Association of Orthodontists.

Today other universities have followed the lead initiated by Dr. Waugh at Columbia and are offering a variety of extension courses. No one better exemplifies the true professional gentleman than do both of our honored guests of today. The Northeastern Society is immensely proud of their wonderful record of achievement. Speaking for the members of the Society, I want to thank Dr. Prezzano, his fellow officers, and the Executive Committee for their thoughtfulness in planning this occasion. To you, Jo, and to you, Leuman, on behalf of the Society which you helped to found and have continued to serve so devotedly, I want to present to each an engraved scroll to hang in your study or office and to each a card of gold to carry with you. May these ever serve their true purpose as reminders of the appreciation and love which we hold in our hearts for you, Dr. Eby and Dr. Waugh.

(The audience rose and applauded.)

Life's most memorable moments are almost certain to come with suddenness and as swiftly to be gone. We are made to hold them in our memory. What a vast storehouse of memories our two founders have! I am sure they will be willing to share some of these memories with us now, and I am going to call on Dr. Eby to speak to us.

DR. EBY: Wilbur, Frank, George, Bo, All My Beloved Friends, Distinguished Guests, and Loved Ones: I guess that is the best way to start; anyway, it is the best the emotions in my heart will permit at this moment! Also, my Buddy—I did not address my Buddy Leuman.

I am sure it is inconceivable for all of you to comprehend the thrills and emotions which will race through the minds and hearts of Leuman Waugh and myself on this occasion. To be thus surrounded by the radiant faces of such a host of distinguished colleagues, beloved and loyal friends, becomes the fulfillment to us of one of our lives' many most beautiful dreams come true, which we both would like to share with you today. Also, it is a very great thrill and honor that Dr. David B. Ast, Chief of the Bureau of Dentistry, New York State Department of Health, has made a special trip to be with us today.

Time limits are too brief to portray the volumes of colorful events during the organizational and formative years of our Society, which history has fully recorded. So much the better, as in skywriting, to dwell upon the highlights within our memories of that happy and alluring period.

Considerable preliminary discussion had preceded the selection of this group later to be known as the Founders. Their selection was rather more

spontaneous than deliberate, and it was not a homogeneous gathering, being of different age ranges and schools of thought, but all functioned together cooperatively perhaps to the best advantage.

This led to two dinner meetings at Bill Fisher's New York Club. The first was more or less nebulous, but favorable, and resulted in further plans for a second get-together.

The most memorable statement during that second meeting was made by Dr. Milo Hellman, to the effect that, "If we did not organize, somebody else would." Dr. Hellman, I marked here, is a man whom I still so deeply revere. This precipitated a unanimous decision and by that our great project, now history, was launched. The fact that Dr. Hellman detached himself from the group for some minor reason has always been a very deep regret to me, and I am sure to Leuman. My feeling is that he belongs there.

Another powerful influence during those meetings was the concern and contemplation over the initiation of a provisional organization which could expand to meet adequately the requirements of a rapidly developing future. With our limited telescopic vision, without the facility of radar, little did we dream of the expansion of our specialty during these forty years, such as by this august assemblage we are capable of beholding here today.

At the time of the organization meeting on Oct. 21, 1921, out of the forty-seven orthodontists in the state of New York twenty-nine were present, and these were placed on our first honor roll as the Charter Members.

It has always seemed to me that these Charter Members, several of whom are present here today, deserved equal recognition; at least they were only a step away from the Founders, and many have performed yeoman tasks from the beginning and throughout the history of the now Northeastern as well as having moved forward to many increasing and greater honors. With full credit to their respective talents, there are none who deserve greater recognition for an amazing record of contributions and loyalty than our own beloved Franklin Squires, both in the Northeastern Society of Orthodontists and in the American Association of Orthodontists.

I would now like to turn to the story of Leuman's and my lives under the title of "The Trails We Have Trod Together."

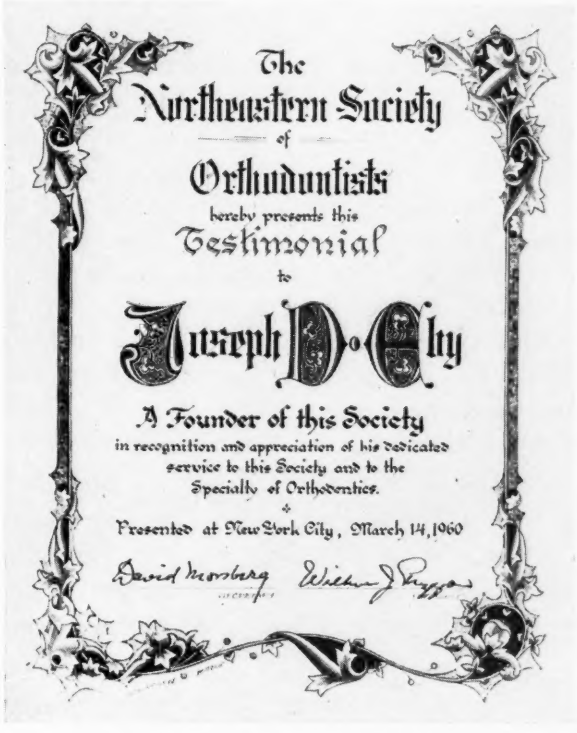
It seems that Destiny was rather deliberate in her planning as a prelude before we actually met. The first crossing of our pathways occurred after I had taken a ten weeks' U. S. Army course in maxillofacial surgery at the Washington University Medical School in St. Louis, Missouri. I was ordered from Nov. 1, 1917, to March, 1918, to the Base Hospital of the 83rd Infantry Division at Camp Sherman, Ohio. This Base Hospital was staffed by the brilliant Base Hospital Unit from Cincinnati, Ohio, which embraced the cream of the profession. They were a very great group of men. They made a wonderful record. The chief of the Medical Service there was a Major Rhinelander. He was a very great stickler for oral physical diagnosis to trace primary foci to secondary organic diseases, mostly infectious hearts and arthritis. He had singled out the mouth as the primary focus, based on the teachings of Dr. Charles Mayo; it was

my duty twice a day to get the patients from the receiving ward, and within twenty-four hours I had to render a physical examination of their mouths and report accordingly, for most of the cases involved infectious hearts, arthritis, and diseases like those, under which a soldier in training would break down.

The first expedient was an x-ray machine. These men were nonambulant, and I said to Major Rhinelander, "What are we going to do about an x-ray?"

"Don't you worry. We are going to have one."

Major Rhinelander went to Cincinnati, and, to use the army vernacular, "scrounged" a little x-ray machine down there and had it sent up to the hospital.



Engraved scroll presented to Dr. Eby by the Northeastern Society of Orthodontists.

They put it on a base with rubber wheels and brakes, so it could be pulled up to a bed for bedside radiographs, according to the orders, and it was done by the x-ray department. It contained the new Coolidge tube, and being used to an x-ray about as big as an upright piano, I was very greatly fascinated by this little fellow on its wheels rolling all around from ward to ward.

I said to Major Rhinelander: "Where did this come from anyway?"

He said: "I don't know too much about it. It was made by Waite and Bartlett, and it is recognized by the name of Waugh."

So there I bumped into my first crossing, and it was at that spot that I made up my mind Dr. Waugh was just one somebody I was going to have to meet.

The second crossing was in October, 1918, at the Dental Battalion, Camp Greenleaf, Medical Officers Training Camp. There arrived without much ceremony one day a Dodge touring car, a gift of the Preparedness League

of American Dentists here in New York. It so happened that Dr. R. Ottolengui was our monthly visiting guest at the time. I asked him about the origin of the car, and he told me that there was a man by the name of Leuman Waugh in New York who had had a hand in it. So that was the second time that my friend again had appeared, and yet we had not met.

Our meeting was at the American Association of Orthodontists (Dr. Mershon's) meeting in 1920, in Chicago, at the Edgewater Beach Hotel. The place was one of those parlor suites, and there was a great gathering. The hijinks was going on at a high level, and I found out there was a get-together of the famous "whiffinpoofs," consisting of Harry Kelsey, Frank Casto, Dr. Mershon, Leuman Waugh, Walter Ellis, Ollie White, Willard Flint, and several others, the likes of those mastodons of orthodontics in the moods of merriment, proving the old tradition that healthy-minded men are only boys grown tall.

Our next trail carried us together to Columbia, and there to me enshrined among our memories are the many years of happy days we spent together. Under the leadership of Dr. Waugh, as Director of Orthodontics, was established the first postgraduate course under accredited university discipline; also, his development of short courses under extension teaching, conducted by Drs. Hellman, Strang, Lischer, Johnson, and others. Outstanding among those in which I participated were some fourteen courses by Dr. Mershon, who graciously propounded his philosophies and famous axioms of orthodontics as a prescribed therapy. John Ross, Franklin Squires, and I did most of the spade work, and I think John Ross is in the room now. Are you not, John? (Applause)

Unparalleled in orthodontic history, through the contributions of his many students, in 1945 a beautiful bronze plaque was suitably unveiled, permanently mounted, looking into his beloved Orthodontic Department at Columbia, immortalizing to posterity the great initiative and contributions, which established the pattern of progress throughout America, of Leuman Maurice Waugh, the Educator.

Our trails have continued throughout the Northeastern, where it seems we have almost always had some different sorts of jobs to do; into the American Association of Orthodontists, where under Leuman's presidency in 1935 the American Society of Orthodontists was reorganized on its present operational basis; and from thence into the responsible years of the American Board of Orthodontics, during a period of that great body's reorganization. Steve Hopkins was there with us.

But there have been many other trails of companionship, including innumerable week ends at the Camp Fire Club, forays with Glenn Young and Henry Barber fishing and hunting at Lake George and into the Adirondacks and Catskills capturing Nature's beautiful autumn tapestries in our cameras. These have included expeditions to Nova Scotia, the Gaspe with Leuman's life cycle of the birds of Bonaventure Island, and the winter sanctuary of Canadian geese, ducks, and swans on the eastern shore of Maryland where he now resides.

We have always enjoyed the intimacies of our domestic and social lives, unfailingly sharing each other's joys and sorrows.

We have also frequently taken stock so as to improve our lives, always with the trust and faith in God's omnipotent "will be done."

We have also learned to use the Golden Rule as a measure and not as a club.

In 1956, when I was desperately ill, Dr. Waugh and five others of our buddies, all of whom are here now, organized, and one day a week for the duration of my illness they came and took care of my practice for me, and I did not know anything about it until I came back. I can assure you through the lump in my throat when I think of it, the hot tears of gratitude still course down my cheeks. I have written here, "Of that greater loyalty hath no man!" Those five other friends are here today.

Upon the passing of Henry Clay Ferris, the fact dawned upon Leuman and myself that we were to be the last of the Founders of the Northeastern. Apropos of all the area we have covered in James Fenimore Cooper's famous narrative, we have dubbed ourselves the last of the Mohicans, with Leuman in the role of Hawkeye and myself Chingaghook, so we are known only to each other as Hawk and Ching—and we are still going strong.

Among his great collection of scientific lore from the ten expeditions into the Arctic among primitive Eskimos was the established fact that an unsweetened tooth does not decay.

I have a little thing in parenthesis here that I wish Dr. Waugh would have time to tell you the story of the red-headed Eskimo. That would really be a good one, for which he is most aptly fitted!

On my numerous and happiest trips to Maryland to enjoy the home life, flowers, and birds with Leuman and Helen, I always take some candies to prove that Leuman has a sweet tooth. That is very definite. Generally he opens up these boxes that I bring down and set before him as bait, and after he contemplates them for a few moments he then picks up his favorite one and says, "Here, have a cavity."

I also wrote down here that among the beautiful views I have shared with Helen and Leuman is their picture window view of the sea lane traffic of the beautiful Chesapeake Bay and, something that may be soothing to his nature as a Scotsman, the distant shore lines of Aberdeen, Maryland, proving ground.

During the twelve summers of camp life in the beautiful sanctuary country of Nova Scotia, salmon and trout fishing, picture taking, and fall moose hunting, it was my great privilege to enjoy the companionship of one of the champion guides of the Province, another Scotsman, Hector MacQuarrie, whose abilities on land and water were exceeded only by his inimitable sense of humor. On several trips, passing that way, the Waughs stopped over and Leuman took a great shine to Hector, and Hector naturally thought Leuman came straight down, much to my delight.

As a fitting conclusion, I should like to repeat one of Hector's favorite toasts—and in doing so I would like to shake your hand, me laird:

There are friends we meet in the City
Who are stout and strong and true.
But the Pal worth while is the Pal of the trail,
So shake, Old Pal, here's to you!

TOASTMASTER SQUIRES: Thank you, Jo.

At this time I am going to call on the other Founder to give us some of his memories.

DR. LEUMAN M. WAUGH: Dr. Squires, My Buddy Jo, Honored Guests at the Head Table, Dr. Ast from the State Department of Health, Members, and Guests:

As Dr. Squires and Dr. Eby were saying such kind and flattering things about me, I had to pinch myself repeatedly to make sure that I was not dreaming but was really awake. I was in the predicament of the Irish mother listening to a student priest eloquently eulogizing her departed husband. She whispered to her young son sitting at her side, "Dinny, will you be seeing if that's your father he's talking about?"

And, speaking of having had to pinch myself, I am also reminded of a little quip which my wife and I enjoyed in the February *Reader's Digest.* Since she is present, I will get it after the meeting if she does not like it; you married men, I know, can understand that. It relates that a Protestant Archbishop of Dublin was being entertained at a dinner in his honor. He was quite elderly and seemed to be perturbed. This was noticed by a venerable lady at his right who was the main support of the diocese. Finally, she heard him whisper mournfully: "Just like my father and mother. I feared it would come some day. My right leg is entirely numb. It is dead. It is going to be useless for the rest of my life."

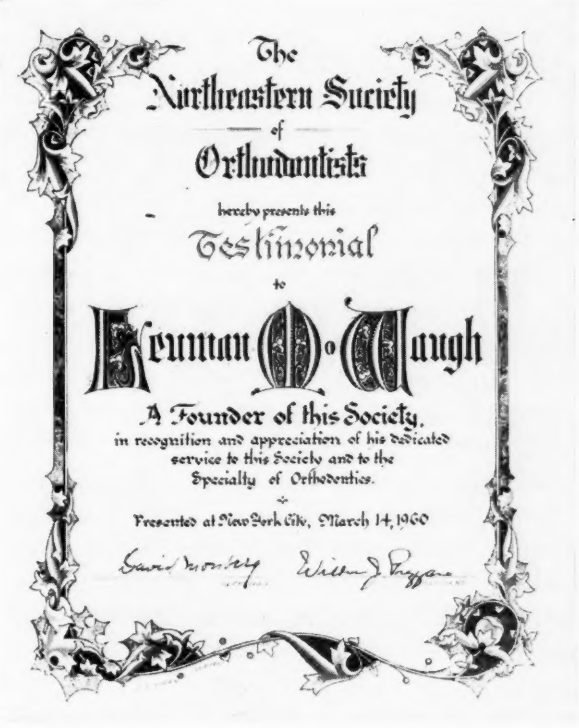
"Your Grace," said the lady, "it might comfort you to know that it is my leg you are pinching."

Your kindness in presenting me with this artistic scroll is deeply appreciated. It will be added to others I have received during the years. And the gold card so expressively inscribed will be carried in my wallet for proud display on special occasions to both friends and enemies, such as perhaps a traffic officer in the hope that it may favorably impress him. In addition, being of gold, it has considerable intrinsic value and may serve to help me home should I find myself short of cash! Seriously, I am most grateful and shall endeavor to continue to merit your confidence and respect.

The fact that the president of the American Association of Orthodontists, George M. Anderson, and the President of the American Board of Orthodontics, L. Bodine Higley, are present to convey the official felicitations of the Association and the Board is most gratifying. The presence of Dr. David B. Ast and his associate of the New York State Department of Health, who have come all the way from Albany to express official greetings, is decidedly touching. To him, may I say that no effort I have ever made gives me greater satisfaction than that of having helped to initiate and to develop the program of the Departments of Health of the State of New York and of the City of New York for the rehabilitation of indigent maxillofacially cripped children. Dr. Ast, in his official capacity, cooperated greatly to the furtherance of that important work. However, I must be mindful of our limited time today.

Dr. Squires and Dr. Eby have related the outstanding events in the organization of our Society. I feel that you, especially our younger members, should

see what our founders and past presidents looked like in the year of their incumbency so that each may mean more than just another name. After conferring with our officers, it was decided that I should project slides of some of our past presidents. As historian, I have had made a complete file of lantern slides of all of our past presidents. Time today will allow that we show only those who have served in the dual capacity of president of both the Northeastern Society and of the American Association of Orthodontists. In the near future, we hope it may be our privilege to show all thirty-eight past presidents. Each in turn contributed much to our advancement.*


The
Northeastern Society
of
Orthodontists
hereby presents this
Testimonial
to
Herman D. Waugh
A Founder of this Society,
in recognition and appreciation of his dedicated
service to this Society and to the
Specialty of Orthodontics.
Presented at New York City, March 14, 1960

Engraved scroll presented to Dr. Waugh by the Northeastern Society of Orthodontists.

Here we have the portraits of the eight Founders. At the upper right is Dr. William Fisher, who first called the group together. At the upper left is Dr. Martin Dewey, under whom many, I am sure, received instruction. On the middle left is our good friend, Dr. Joseph D. Eby, a handsome young blade in his soldier days. In the center is Dr. J. Lowe Young, the first president of the organization and the second orthodontist to practice in the city of New York. On the lower left is Dr. Henry Clay Ferris, whose death about fifteen years ago left Dr. Eby and myself as the two surviving Founders. Then below, in the middle, is Dr. Victor Hugo Jackson, whom you know very well through his writings and his many contributions to the advancement of orthodontics of the earlier days; he was Professor of Orthodontics at Michigan and at the University of Buffalo where I was a student, and he was responsible in large part for my

*Slides were shown here.

first efforts in orthodontics. At the lower right is Dr. C. W. B. Wheeler, who was the third president. Just to the middle on the right is a dark-haired chap with a dark mustache, the speaker. Remember, these portraits were taken at the time of our incumbencies as officers and presidents of the Northeastern!

The next slide will show Dr. J. Lowe Young, our first president, who also served in 1921 as president of the American Association of Orthodontists, having a dual duty that year. He was a genuine crusader, a great missionary for orthodontics.

The next slide will be that of Dr. Herbert A. Pullen, of Buffalo, who was our second president and the first orthodontist in Western New York State. His home was in Buffalo, and he had a branch office in Rochester.

The next slide is the gay young blade who has just addressed you. Would you think it? A soldier man, just out of Walter Reed Hospital! As I look at this picture of my good friend, and taking the privilege of joking with him as we always do when we are alone, it reminds me that every baby at one time had hair. Dr. Eby was president of the Northeastern in 1925 and of the American Association of Orthodontists in 1927.

The next slide is of our venerable John V. Mershon. We all know Dr. Mershon so well. He was president of the Northeastern in 1926 and of the American Association of Orthodontists in 1920. Dr. Mershon was the second specialist in Philadelphia.

The next slide is of the speaker, president of the Northeastern in 1927 and of the American Association of Orthodontists in 1935, just twenty-five years ago now, when we were having the first meeting of the American Association of Orthodontists in this hotel. There had not been a meeting of the American Association in New York for twenty-nine years. This hotel was wonderful to us, giving us every facility for making that meeting a huge success.

The next one is Dr. Frank A. Delabarre, of Boston, who was president of the Northeastern in 1928 and of the American Association of Orthodontists in 1939. The first meeting of the Northeastern that was held outside New York City was held by Dr. Delabarre in Boston.

The next one is Dr. Charles A. Hawley, of Washington, president of the Northeastern in 1929 and of the American Association of Orthodontists in 1909. He was the first and only specialist in the District of Columbia for ten years.

The next is Dr. William C. Fisher, who was president of this Society in 1930 and of the American Association of Orthodontists in 1926. He was president general of the First International Orthodontic Congress, which was held in New York City in 1926. He introduced the idea of an international congress, took trips to Europe, and did a great deal of the spade work, and to him we owe a great debt of gratitude.

The next is Dr. Lowrie J. Porter, who was president of the Northeastern in 1932 and of the American Association of Orthodontists in 1949. That is Lowrie as he was in 1932. No wonder Priscilla fell in love with him!

The next is Dr. Harry E. Kelsey, of Baltimore. He served this Society as president in 1933 and had been president of the American Association of Orthodontists in 1931. He was the first orthodontist in Maryland.

The next is Dr. Henry U. Barber, Jr., who was president of the Northeastern in 1936 and of the American Association of Orthodontists in 1941, when the meeting was also held in this hotel.

The next is our beloved Dr. Alfred Paul Rogers, who was president of the Northeastern in 1938 and of the American Association of Orthodontists in 1911. He was the first orthodontist to practice in New England, starting practice in Fall River in 1903 and then moving to Boston about 1905.

Our next is Dr. Franklin A. Squires. He was president of this Society in 1939 and of the American Association of Orthodontists in 1958. Franklin too was then, as now, a gay young blade.

Next is Dr. Philip E. Adams, who was president of this Society in 1955, which overlapped his tenure of office as president of the American Association of Orthodontists in 1956.

The Northeastern has been honored by having fourteen of its thirty-eight past presidents similarly honored by the American Association of Orthodontists. We have just seen the portraits of these men.

In addition, five past presidents of the American Association of Orthodontists were Northeastern members, namely, Drs. Kemple, Dewey, Waldron, Ellis, and Anderson. If anyone has any question about Dr. Anderson, I want you to remember that he was an active member of this Society for over thirty years and that he is now a nonresident member. I wouldn't like him to know that I am saying this, but I do think the Northeastern stood squarely behind his nomination and had a lot to do with his well-deserved election as president of the American Association of Orthodontists. Therefore, of the fifty-three presidents of the American Association of Orthodontists, nineteen were members of our Society; thus, the Northeastern has provided over one-third of the presidents of the American Association of Orthodontists a noteworthy contribution.

In closing, it seems fitting that we bring the Society up to the minute and I should like to show next a portrait of our immediate past president, Dr. Walter R. Bedell, and one of the present incumbent as our president for a few hours longer, Dr. Wilbur J. Prezzano.

Thank you very much.

TOASTMASTER SQUIRES: Thank you, Leuman. We all appreciated that very much indeed, and without further ado I am going to turn the meeting back to your president, Dr. Prezzano.

PRESIDENT PREZZANO: This has truly been a wonderful occasion. All of us wish to extend our most sincere congratulations and felicitations to these two grand gentlemen, and we thank you, Dr. Squires, for your very fine presentation.

We shall now adjourn to the Sert Room where the scientific session and program will be resumed.

Department of Orthodontic Abstracts and Reviews

Edited by
DR. J. A. SALZMANN, NEW YORK CITY

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. J. A. Salzmann, 654 Madison Avenue, New York.

A Longitudinal Study of the Results of Premature Extraction of Deciduous Teeth Between 3-4 and 13-14 Years of Age: By Lilah M. Clinch (Statistical Appendix by M. J. R. Healy), *D. Practitioner* **9**: 109-126, 1959.

Most of the work published on this subject has shown the results of premature loss without any history of the occlusion before the extractions or of the changes which took place during the years intervening between the extractions and the final result. It is misleading to attribute imbrication in the permanent dentition to premature loss of deciduous teeth when there may always have been imbrication, but that type of mistake is likely to be made if conclusions are drawn only from the history of the extractions. From serial models, it is possible to tell the type of occlusion before the extractions, the stage of development as distinct from the chronological age at which the teeth were removed, and the changes which followed. This paper represented an attempt to summarize this information from twenty-nine children who had carious deciduous teeth extracted before their natural shedding time and whose occlusion had been studied during a period of eleven years.

The material for this study was from a series of models of children of whom impressions were taken at yearly intervals 3 to 4 and 13 to 14 years of age, in other words, each series of models covers eleven years. They are an unselected group of children who happened to be born at the same maternity hospital and whose mothers attended antenatal and postnatal clinics in health centers in the same neighborhood.

Two measurements were taken of the quadrants of each upper and each lower model:

1. From the midline to the distal contact point of the lateral incisor or, if the lateral incisor was shed or not in the line of the arch, to the mesial contact point of the canine. (The midline on the lower model was taken as the midpoint between the central incisors. In most cases the elongation of the median raphe was used as the upper midline; if this was not possible, the midpoint between the central incisors was used.)

2. From the distal point used in the last measurement to the distal surface of the second deciduous molar as near to the point of contact with the first permanent molar when it erupted as could be judged or to the mesial contact point of the first permanent molar if the second deciduous molar had been extracted or shed.

In addition to the arch measurements, the tooth breadths of the first and last models were also measured, as the problem of the variation in final loss of space might be connected with a primary tendency to crowding due to a discrepancy between tooth size and arch size apart from the result of the extraction. This was studied in two ways:

1. A determination of the association between (a) relative spacing in the deciduous dentition before any extractions had occurred and (b) the amount of space loss during the whole observation period.

2. A determination of the association between (a) the size of the permanent teeth and (b) the amount of space loss just mentioned.

Spacing in the deciduous dentition seems to have a connection with the degree of space loss after extractions, but the connection differs in the two arches. It is very apparent in the upper arch and less so in the lower. The space loss after extraction is always greater in the upper arch than in the lower arch, and there is less surplus space after the shedding of deciduous molars in the upper than in the lower. This explains to some extent the findings, in the measurements of the extraction cases, that there is a significant correlation between space loss (the decrease from the first to the last models) and spacing (the difference between arch measurement and total tooth measurement in the first models), but it is a negative correlation in the upper arch and a positive in the lower arch.

In children with well-developed arches the migration was usually small and temporary, and in one case there was not even a temporary reduction in space. Of the twenty-nine cases, ten showed no imbrication in the final models (some had spacing) after the full eruption of the premolars and second molars, despite the extraction of both first and second deciduous molars in all quadrants of both arches between the ages of 6½ and 8½ years; in all of these cases there was good spacing in the first models. The greatest permanent damage was done in the less well-developed arches in which there was no spacing at 3 to 4 years. The lack of space tended to increase in subnormal arches.

The extraction of the second deciduous molar produced considerably more space loss than the extraction of the first deciduous molar. Incisors were extracted in only one case, and this showed no permanent space loss.

If there were extractions of either first or second deciduous molars before the first permanent molars erupted, the loss of space was never fully recovered in the upper arch. As for the lower arch, two out of seven showed no imbrication, even after very early extractions, but one of these was a case of prenormal mandible. In the other a lower first deciduous molar was extracted at 5½ years; this case had good spacing at 4 years, and at 14 years there was spacing between the upper canines and first premolars on both sides and in the lower arch on the nonextraction side. On the extraction side, although there was no imbrication, there was no spacing; thus, it would appear that there was loss of space.

Unilateral extractions had varying effects. A comparison between space loss in the lower arch on the right and left sides in unilateral extraction cases may not be very accurate and could be misleading. Cuspal interlock seemed to reduce the space loss in some cases and not in others.

The reduction in space, both temporary and permanent, is much greater in the upper than in the lower arch. In the upper arch more space appears to be lost by the mesial migration of the teeth posterior to the site of the extraction, while in the lower arch there appears to be a greater tendency to space loss due to lack of forward growth of the teeth anterior to the extraction. The greater tendency to shift of the lower midline in unilateral extraction cases would demonstrate this. If the second deciduous molar is extracted before the eruption of the first permanent molar in the upper arch, the first permanent molar may erupt in contact with the first deciduous molar as a result of only a slight additional movement, whereas in the lower arch the additional movement of the first permanent molar would be so much greater that there is never such a marked loss of space.

The order of eruption of the teeth had some effect on determining the area of imbrication. Where there was a reduction in space, the canine was usually crowded out of the arch if it erupted after the premolars, but if the upper second deciduous molar was extracted before the first permanent molar erupted the space for the second premolar was invariably reduced instead of the canine space. The eruption of the second molars before the premolars did seem to have some effect on the space loss, but this happened rarely. It has been stated that there is a certain tolerance for decrease of space values in the premolar region because of the lesser dimensions of the permanent teeth. It should be remembered, however, that if the second permanent molars are to occlude correctly this extra space in the premolar region should be used up partly to accommodate the permanent canine and partly to allow a greater mesial migration of the lower first permanent molar than of the upper first permanent molar.

Extractions before the first permanent molars had erupted resulted in permanent loss of space, but to a varying degree and more in the upper arch than in the lower arch. Well-developed arches showed little, if any, permanent space loss following later extractions. Even when there was no obvious imbrication, there was a tendency to a "tightness" between the teeth, especially the premolars and first permanent molars, which might predispose to interstitial caries. Even a reduction of 0.10 mm. would make a difference in the pressure at the contact point.

Investigation Concerning the Activity of the Human Muscles of Mastication During Sleep at Night: By Ewald Kraft. *Stoma* **13**: 7-21, 1960.

With the help of a register installation, based on electromyography, which was constructed for this purpose, 167 persons were examined as to a muscle activity during sleep at night.

Nearly all human beings show a more or less strong activity of their muscles of mastication when sleeping. Only 10 per cent of all examined persons showed no such activity. Muscle activity varied from only a few to 259 registered contractions during eight hours of sleep. For most of the volunteers, the duration of the action of the muscle was less than a second, but contractions of nearly one minute were also found. Mostly muscle activity was repeated over all the sleeping time.

Most of the persons examined showed, besides "tonic-horizontal" movements, "clonic-vertical" movements of the mandible against the maxilla. The rate of persons who can be called "grinders" and "squeezers" is as 1:1. The majority of the volunteers expended forces of from 10 to 20 kg. for the "empty mastication" during sleep.

A significant influence of the patient's age or the kind of denture or prosthesis worn in regard to the occurrence and extent of the nightly "empty mastication" could not be proved.

Orthodontic Treatment for Children: *J. A. M. A.* **172**: 1575, April 2, 1960.

In the "Questions and Answers" section of the *Journal of the American Medical Association,* a California physician asks: "A ten-year-old girl has moderately severe malalignment of her teeth. Should orthodontic treatment be started immediately or should it be postponed until the teeth are more permanent and growth is almost completed?"

The *Journal's* reply to this question is that correction should be started as soon as possible after diagnosis, since treatment begun in early childhood is usually more successful and of shorter duration. The physician is advised to refer such a patient to a dentist at once for preliminary evaluation and such

specialized treatment as may be deemed necessary. It is pointed out that the alert physician can forestall serious orthodontic and personality problems by prompt referral of young patients in whom dental abnormalities are observed or suspected.

Dento-Maxillaire, Faciale, Craniale en Cervicale Orthopedie (Dento-maxillary-facio-cranio-cervical Orthopedics): By J. A. C. Duyzings. T.D.V. Tand. 66, No. 1D, 1959, G. J. & D. Tholen, Utrecht, Holland.

In a large number of cases, orthodontic changes should be considered within a much wider frame than that circumscribed exclusively by the teeth, jaws, and adjacent soft tissues, particularly if the equilibrium in developmental dynamics is disturbed by unfavorable forces entailed in undesirable habits contracted during a very early phase of life. Sequelae may extend considerably beyond the limits of anomalies in the position of the teeth and the relationship of the jaws. By disturbing the interaction of the muscle groups involved, such forces may exert an unfavorable influence on such factors as the position of the head relative to the vertebral column; they may cause undesirable curvatures of the cervical spine and influence the entire posture of the body. The untoward sequelae, therefore, are both functional and morphologic in character. The mouth breathing often associated with such undesirable habits constitutes a further complication.

The conventional orthodontic measures should be supported by myotherapy, that is, by appropriate gymnastic exercises of the muscles underdeveloped due to hypofunction, with the object of promoting the harmonious interaction between the various muscle groups in the exceedingly dynamic region of the mandible, the hyoid bone, and the cervical vertebrae, thus ensuring optimal function and morphologic and esthetic results.

In this respect, special attention is drawn to the so-called "penny therapy" advocated by the author, particularly in the treatment of patients subject to mouth breathing. In this treatment, the patient is asked to grasp a coin the size of an English pennypiece between the lips (not the teeth), keeping it in a horizontal position. This promotes restoration of the lips to a more effective form and function. The forced closure of the lips leads to restoration of nasal breathing, while at the same time the mandible and the hyoid bone are forced to assume a more favorable (anterior) position, so that the function of the tongue, the muscles of the floor of the mouth, and the lips is inevitably improved.

Supplemental exercises to promote a correct position of the head relative to the spine, a physiologic curvature of the cervical column, and therefore a more physiologic body posture are briefly described.

News and Notes

American Association of Orthodontists

The next annual meeting of the American Association of Orthodontists will be held April 16 to 21, 1961, at the Denver Hilton Hotel in Denver, Colorado. A. A. O. officers and committees are as follows:

OFFICERS

President, William R. Humphrey - - - - - - - 1232 Republic Bldg., Denver, Colorado
President-Elect, Dallas R. McCauley - - - 410 S. Beverly Dr., Beverly Hills, California
Vice-President, Cecil G. Muller - - - - - Dodge at 35th Ave., Omaha, Nebraska
Secretary-Treasurer, Earl E. Shepard - - - 225 South Meramec Ave., Clayton, Missouri

Board of Directors (one director from each constituent society):

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Leigh C. Fairbank
Frank Roark
Robert E. Moyers
Herbert I. Margolis
Philip E. Adams
J. Lyndon Carman
J. A. Salzmann
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William H. Oliver
C. Douglas Hoyt
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Editor, H. C. Pollock - - - - - - - - - 8229 Maryland Ave., St. Louis, Missouri

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Denver Civic Center. One of the most famous views in America, looking from the west steps of the Colorado Capitol Building across Denver's Civic Center. At the west side of the Center is the classic City and County Building. Grounds are beautifully landscaped with trees from many lands. At left, partially hidden by trees, is the Greek Theater where many outdoor cultural events are held each summer. In the background are the snow-crowned Rockies of the Front Range.

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Elbert W. King
Kenneth R. Johnson
Harold E. Rice

Colorado Public Relations Dept. Photo.

Refreshing and relaxing—that's the story of a vacation in the lovely mountains of colorful Colorado. These visitors are soaking in the spectacular beauty of gemlike Loch Vale, against the spectacular backdrop of Taylor Peak in Rocky Mountain National Park. The park is one of two national parks in Colorado, which also has five national monuments and eleven national forests. Complete information about Colorado vacations may be obtained by writing Dept. T, the Colorado Visitors Bureau, 225 W. Colfax Ave., Denver 2, Colorado.

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Wives of Rocky Mountain members

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William B. Stevenson
Harold K. Terry
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Tom M. Williams
Howard L. Wilson
Howard Yost

American Association of Orthodontists Establishes Central Office and Seeks Administrative Secretary

The American Association of Orthodontists has established a central office in Room 303 of the Coronet Building, 225 South Meramec Ave., St. Louis, Missouri.

The office is currently being conducted by Secretary Earl E. Shepard with the aid of Mrs. Pat Kerr, assistant secretary.

It is the desire of the Association, as stated at the annual meeting in Washington, D. C. that ultimately a secretary of administrative or executive stature be employed to head this office.

It is to be remembered that an active, aggressive person is preferred, one who not only has qualifications for running a business office but who has an understanding at least of public relations.

Therefore, if any member has knowledge of a qualified man, he is requested to ask him to contact the secretary at the above address.

American Board of Orthodontics

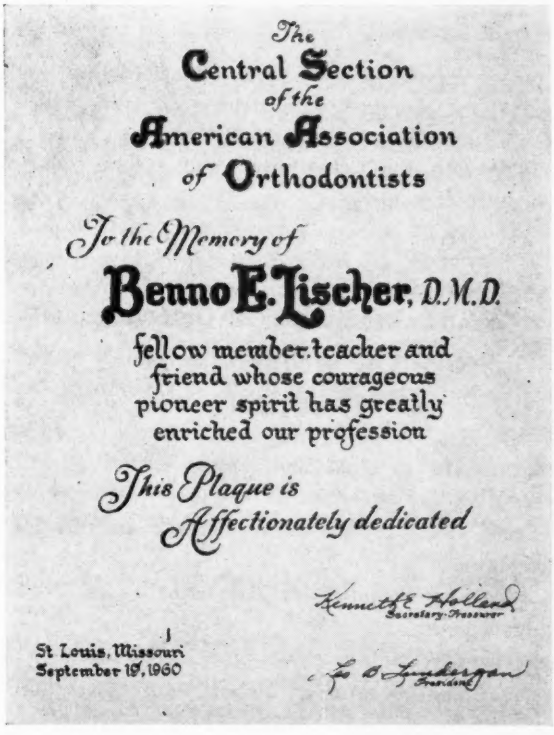
The next meeting of the American Board of Orthodontics will be held at the Denver Hilton Hotel in Denver, Colorado, April 10 to 15, 1961. Orthodontists who desire to be certified by the Board may obtain application blanks from the secretary, Dr. Alton W. Moore, University of Washington School of Dentistry, Seattle 5, Washington.

Applications for acceptance at the Denver meeting, leading to stipulation of examination requirements for the following year, must be filed before March 1, 1961. To be eligible, an applicant must have been an *active* member of the American Association of Orthodontists for at least two years.

Central Section of A. A. O. Pays Tribute to Benno E. Lischer

On Monday, Sept. 19, 1960, President Leo B. Lundergan, on behalf of the Central Section of the American Association of Orthodontists, presented to Dr. Carl E. Lischer, representing the family of the late Benno E. Lischer, the plaque shown here. This plaque,

in turn, was presented to Dean Leroy R. Boling, representing Washington University School of Dentistry where it will be placed on the wall of the Library. A copy of the plaque was also given to Mrs. Lischer, who was present for the ceremony with her two daughters, Mrs. Mary Louise Drewes and Mrs. Grace Brumbaugh.



Plaque presented to the family of the late Benno E. Lischer by the Central Section of the American Association of Orthodontists.

Central Section of the American Association of Orthodontists

At the annual meeting of the Central Section of the A. A. O., which was held at the Park Plaza Hotel in St. Louis, Missouri, Sept. 18 to 20, 1960, A. A. O. President William R. Humphrey addressed new members and associate members of the Central Section as follows:

> By action of the Board of Censors and by unanimous vote of the membership, you have been elected to membership in the Central Section of the American Association of Orthodontists. I want to congratulate you.
>
> You have, in effect, been given a letter of introduction to 2,000 other orthodontists in America (and I mean this literally), because your membership card is always welcome in all the component societies and by all members of the American Association of Orthodontists.
>
> The Qualifying Committee and the Board of Censors have examined your record, both as to your conduct as gentlemen and your ability as orthodontists, and you have not been found wanting. May I admonish you that a great many people in your community will judge the Central Section by your conduct. Always let your actions speak a good word for your Association. As you grow older in practice, take part in the cultural, social, and civic interests of your community.

Be good citizens and in this way help preserve the good public esteem which orthodontics has always enjoyed.

The Central Section of the American Association of Orthodontists seeks to exemplify, enforce, and develop the highest tradition in the practice of orthodontics.

PLEDGE

Raise your right hand and repeat after me:

> I pledge myself, as a condition of membership in the Central Section, to live in strict accordance with all of its principles, declarations, and regulations, to comply with the Constitution and Bylaws, and to adhere to this pledge.

Great Lakes Society of Orthodontists

The thirty-first annual meeting of the Great Lakes Society of Orthodontists will be held Nov. 27 to 30, 1960, at the Netherland-Hilton Hotel in Cincinnati, Ohio. The scientific program will be as follows:

Cephalometrics as an Aid to Plan and Assess Orthodontic Treatment. Cecil Steiner, Beverly Hills, California.

Thumb-Sucking—Facts, Fictions, Permissive Treatment. David Hamilton, New Castle, Pennsylvania.

Control of Anchorage and Retention in Extraction Cases. Robert Moyer, Ann Arbor, Michigan.

Extraoral Traction Therapy. Sidney Asher, Chicago, Illinois.

Mandibular Ostectomy and Osteotomy. Robert Ponitz, Ann Arbor, Michigan.

Light Wire Differential Forces in the Treatment of Dental Malocclusions. Joseph R. Jarabak, Chicago, Illinois. (Schematic drawings and Kodachrome slides will be used to illustrate the three treatment steps.)

The Edgewise Appliance as Used With Extraoral Therapy. Samuel Ackerman, Cincinnati, Ohio.

Table Clinics.

In addition to the above, there will be a Fellowship Luncheon, featuring an address by William R. Humphrey, president of the American Association of Orthodontists; an American Board of Orthodontics Breakfast, open to all Society and diplomate members, with Edward Martinek of Detroit, Michigan, past president of the American Board of Orthodontics, as speaker; a Past President's Luncheon; an "Over the Rhine" party; and the President's Reception and Dinner.

Pacific Coast Society of Orthodontists*

NORTHERN COMPONENT

The regular meeting of the Northern Component, P.C.S.O., was conducted June 13 and 14 at Harrison Hot Springs, British Columbia.

*Excerpts from the *Bulletin* of the Pacific Coast Society of Orthodontists, August—September, 1960.

Chairman Denton Rees called the meeting to order at 9:00 A.M. on June 13, 1960. The meeting was turned over to program chairman Robert Kemp who introduced Dr. Morris Stoner of Indianapolis, Indiana. Dr. Stoner showed slides and lectured on his ideas concerning controlled forces in orthodontic treatment and properties of wires used in orthodontic treatment. The program for the two-day meeting was ably taken care of by Dr. Stoner. Many favorable comments were given regarding the presentation.

CENTRAL COMPONENT

The first joint meeting of the Central and Southern Components of the Pacific Coast Society of Orthodontists was held on June 20, 1960, at the Fairmont Hotel in San Francisco.

We were fortunate to initiate this series of joint meetings with a clinician of international fame, Dr. P. Raymond Begg of Adelaide, South Australia.

The presence of Dr. Begg and the excellent program were the result of creative and intensive planning on the part of Don Priewe, ably assisted by Phil Konigsberg and his committee. The financial arrangements were handled by Jim Seaman.

Prior to the start of the meeting the members had an opportunity to examine a large number of plaster models that Dr. Begg, at considerable cost and time, was kind enough to bring to the meeting and to display on tables in the adjoining room. This display of plaster models was one of the finest we have seen, an excellent testimony to the dramatic and amazing results that are obtained by Dr. Begg with his light wire technique.

Chairman John Parker, who acted as Host Chairman, presented Dr. Begg at the morning session. Dr. Begg gave an excellent presentation on the techniques of the light wire appliance and the use of differential force. His talk was well illustrated with slides. An excellent luncheon was enjoyed by some 200 members in the Gold Room of the Fairmont Hotel.

Immediately after lunch each component adjoined to the different rooms for their respective business meetings.

SOUTHERN COMPONENT

The first joint meeting of the Central and Southern Components of the Pacific Coast Society of Orthodontists was a distinct success. There were 70 members and guests from the south, which equals our average attendance in Los Angeles. The meeting was opened by Dr. John Parker at 9:40 A.M. He introduced Dr. Raymond Begg of Adelaide, Australia, as the speaker of the day.

American Dental Association*

SPECIALTIES CONFERENCE DRAWS 70

The question of specialties within the profession was the subject of a two-day conference held Sept. 7-8 at the Central Office. Approximately 70 representatives from over 30 national specialty groups attended as participants or observers. The meeting was sponsored by the ADA Council on Dental Education. A chief topic of discussion during the two days was the difficulty of satisfactorily defining the existing and potential areas of specialization so that they would be mutually exclusive. As a number of the speakers noted, mentioning the name of a particular specialty area may well evoke an "image" of that specialty in the mind, but verbalization of the image remains a formidable task. One suggestion considered during the meeting was that the combination of a definition and the "image" might well be enough to establish boundaries. Another topic discussed by the group was the report of the Council on Dental Education which will be submitted to the House of Delegates in Los Angeles. This report recommends continued affirmation by the House of the presently recognized seven specialty areas and asks that the moratorium on recognition of new specialties be continued for another year.

*From the *ADA Newsletter*, Sept. 15, 1960.

KENTUCKY DENTIST JOINS HEALTH BOARD

A Louisville, Ky., dentist [and orthodontist], Dr. John A. Atkinson, has become the first of his profession to be named to that state's Board of Health. Dr. Atkinson was named by Gov. Bert Combs from a list of three dentists proposed by the Kentucky Dental Association. A dental member on the State Board was authorized by an act of the 1960 General Assembly of that state. Dr. Atkinson is a former head of various dental groups.

TWO SCHOOLS RECEIVE FEDERAL GRANTS

Grants totaling over $500,000 were made recently by the Federal Government to two of the nation's dental schools. The grants were among the first to be awarded from appropriations for fiscal 1961 from the Health Research Facilities Program Awards Fund and are given on a matching basis. The University of Kentucky, Lexington, Ky., received $46,350 for equipment for a Dental Science Research Building and Loyola University, Chicago, Ill., received $521,700 for research laboratories in a new Dental School building. The grant program is administered by the National Institutes of Health.

British Society for the Study of Orthodontics

The program of the British Society for the Study of Orthodontics for the remainder of 1960 is as follows:

November 14. The Fourteenth Northcroft Memorial Lecture. Mr. R. E. Rix.
December 12. Paper by Miss D. R. Ridley.

The Society's address is Manson House, 26, Portland Place, London, W. 1, England.

First Australian Orthodontic Congress

The first Australian Orthodontic Congress will be held in Sydney, Australia, Aug. 9 to 11, 1961, immediately preceding the sixteenth Australian Dental Congress.

Centennial Congress of the Swedish Dental Society

The Swedish Dental Society held its centennial congress in Stockholm, Sweden, August 17 to 20, 1960. The program included a symposium on orthodontic research in Sweden, with Anders Lundström as moderator. Participants were as follows:

L. Lennart, Umea. Normal Development Occlusion During the Deciduous and Mixed Dentition Period.
Blenda Persson, Stockholm. Interceptive Orthodontic Treatment in Deciduous and Mixed Dentition.
Karl-Axel Granse, Malmo. Interceptive Measures in Case of Supernumerary Teeth.
Harry Sundling, Orebro. Interceptive Measures in Cases of Absence of Teeth—Congenital Aplasia.
T. M. Graber, Chicago, Ill. Long-Term Results of Orthodontic Treatment.
Birger Kjellgren, Stockholm. Discussion.

Bicentennial of the Death of Pierre Fauchard

It will soon be 200 years since the death of Pierre Fauchard, recognized all over the world as the creator of modern dentistry. French dentists have decided to observe this significant anniversary with special ceremonies in Paris on July 1 and 2, 1961, and they cordially invite colleagues from all countries to join them.

The complete program will be made available later, but already it can be announced that a monument erected through the efforts of the committee in charge of the observance will be dedicated in the court of honor of the chateau of Grand-Mesnil, where Fauchard

lived, at Orsay near Paris; a solemn meeting in the grand amphitheater of the Sorbonne will be attended by members of the French Government; and the work which made Fauchard immortal, *Le chirurgien dentiste,* will be republished.

The dates of the bicentennial observation, chosen to permit participation by the greatest possible number of colleagues, fall between the dates of the Paris congress of the American Dental Society of Europe (June 24 to 30) and the annual meeting of the Fédération Dentaire Internationale in Helsinki (July 9 to 16).

Further information may be obtained from M. Max Filderman, Secretaire General, du Comite National du Bicentenaire de Fauchard, 67, rue de Tocqueville, Paris 17e, France.

Specialties Reference Group Named*

Because of the interest in various problems related to specialties in dentistry, President Paul H. Jeserich has appointed a Reference Committee on Dental Specialties for the 1960 Annual Session, Oct. 17-20, in Los Angeles. Members of the committee are Drs. Wilbur D. Johnston, New Haven, Conn., chairman; David E. Hunn, Troy, N. Y.; Allen M. Ito, Honolulu, Hawaii; John W. Knutson, Washington, D. C.; and Carl J. Stark, Cleveland, Ohio.

Announcement of Regular Corps Examination for Dental Officers, United States Public Health Service Commissioned Corps

Competitive examinations for appointment of dentists as officers in the Regular Corps of the United States Public Health Service Commissioned Corps will be held throughout the United States on Jan. 31, and Feb. 1, 2, and 3, 1961.

Appointments provide opportunities for career service in clinical dentistry, research, and public health. They will be made in the PHS officer grades of Assistant Dental Surgeon and Senior Assistant Dental Surgeon, equivalent to Navy ranks of Lieutenant (j.g.) and Lieutenant, respectively.

Entrance pay for assistant dental surgeon with dependents is $7,345.00 per year; for senior assistant with dependents, it is $7,986.00. Promotions are made at rapid intervals.

Benefits include periodic in-grade pay increases, thirty days' annual leave with pay, sick leave with pay, full medical care, disability retirement pay, retirement pay (three-fourths of annual basic pay at time of retirement), and many other privileges.

Active duty as a Public Health Service officer fulfills the Selective Service obligation for military duty.

Requirements are United States citizenship and graduation from a recognized school of dentistry. For the rank of assistant dental surgeon, at least seven years of collegiate and professional training and appropriate experience are needed. For senior assistant dental surgeon, an additional three years, for a total of at least ten years of collegiate and professional training and appropriate experience, is needed. For appointment to the assistant grade, candidates must be under 34 years of age; for the senior assistant grade, they must be under 37.

Entrance examinations will include an interview, physical examination, practical examination, and comprehensive objective examinations in the appropriate professional fields.

Application forms may be obtained by writing to the Surgeon General, United States Public Health Service (P), Washington 25, D. C. Completed application forms must be received *no later than Dec. 2, 1960.*

Northwestern University

The Department of Orthodontics of Northwestern University Dental School will present a three-day course on "Analysis and Treatment of the Stomatognathic System for the Orthodontist" on Dec. 5, 6, and 7, 1960.

*From the *ADA Newsletter,* Sept. 30, 1960.

All communications regarding the course should be addressed to Director of Dental Postgraduate Study, Northwestern University Dental School, 311 E. Chicago Ave., Chicago 11, Illinois.

University of Pennsylvania Research and Teaching Traineeships

Research and teaching traineeships in the basic sciences, in periodontology, and in the comprehensive treatment and rehabilitation of the cleft palate patient are available at the School of Dentistry, University of Pennsylvania.

Candidates for the traineeships in the basic sciences must qualify for admission to the Graduate School of Arts and Sciences. These traineeships may lead to M.S. or PH.D. degrees.

The traineeship in periodontology is a two-year program devoted to basic science studies, clinical practice, and research. It is intended primarily for those who wish to enter teaching and research in periodontology.

The traineeship in the comprehensive treatment and rehabilitation of the cleft palate patient is clinically oriented; however, opportunities for course work in fields related to cleft palate therapy are available.

All traineeships are supported by the United States Public Health Service. Annual stipends are $4,500.00 and up, depending on the qualifications and needs of the successful candidates. Inquiries concerning the basic science and cleft palate traineeships should be sent to the Chairman, Committee on Traineeships and Fellowships, University of Pennsylvania, School of Dentistry, 4001 Spruce St., Philadelphia 4, Pennsylvania. Inquiries about the traineeships in periodontology should be sent to the Dean, Graduate School of Medicine, 237 Medical Laboratories, University of Pennsylvania, Philadelphia 4, Pennsylvania.

Orthodontic Directory of the World

The twentieth edition of the *Orthodontic Directory of the World,* published every two years, is off the press and has been mailed to those who placed prepublication orders. Should some of these *Directories* not have been received, inquiries should be made directly to *Orthodontic Directory of the World,* 1915 Broadway, Nashville, Tennessee, as should other requests concerning this *Directory.*

Norwegian Orthodontic Society

T. M. Graber of Kenilworth, Illinois, was the essayist at a meeting of the Norwegian Orthodontic Society in Oslo, Norway, Aug. 22, 1960. His subject was "Long-Term Results of Orthodontic Treatment." Twenty-five members of the Society were present.

Dr. Graber discussed the various types of malocclusion and analyzed them in the light of posttreatment stability. A great number of finished cases were re-examined after several years out of retention, and he found that certain well-known and widely used procedures of treatment are likely to result in relapse. He stressed, for instance, the importance of paralleling the roots in extraction cases, of moving the roots of the upper anterior teeth backward in cases of horizontal overbite, of maintaining arch form and arch length unless the muscle pressures have been changed, and of overdoing the treatment of rotated teeth. A great number of instructive slides were used to supplement the lectures.

The members of our Society are deeply indebted to Dr. Graber for his presentation. It was of great value for us to share his experience and thorough understanding of orthodontic problems, and we will welcome him back whenever he finds an opportunity to come.

Olav Slagsvold, President
Norwegian Orthodontic Society
Karl Johansgt. 20
Oslo, Norway.

National University of Mexico

The School of Dentistry of the National University of Mexico announces the formation of a graduate course in orthodontics. The course will be under the direction of Dr. E. H. Hixon.

Death of H. Harvey Payne

With regret, we report that H. Harvey Payne of Atlanta, Georgia, died on Sept. 21, 1960.

Notes of Interest

Dr. C. Moody Alexander announces the opening of his office at 305-B North Alleghaney, Odessa, Texas, practice limited to orthodontics.

Dr. James D. Glerum announces the association of Dr. Darwin J. Weersing, 326 Medical Arts Bldg., Grand Rapids, Michigan, practice limited to orthodontics.

William S. Gray, D.D.S., announces the association of Leslie W. Doss, Jr., D.D.S., at 507 Bennie-Dillon Bldg., Nashville, Tennessee, practice limited to orthodontics.

Marshall Ludwig, D.D.S., will open a new office for the exclusive practice of orthodontics in the West Valley Medical Center, 5353 Balboa Blvd., Encino, California, on approximately Dec. 1, 1960.

William W. Paden, D.D.S., and Donald R. Poulton, D.D.S., announce the formation of a partnership for the practice of orthodontics at 1721 Santa Clara Ave., Alameda, California.

Irving L. Shore, D.D.S., M.S., announces the removal of his office to 6201 Castor Ave.. Philadelphia, Pennsylvania, practice limited to orthodontics.

Drs. Edward I. Silver and William E. Silver announce the association of Dr. Boris Novak in the practice of orthodontics at 80 Boylston St., Boston, Massachusetts.

Forthcoming meetings of the American Association of Orthodontists:

1961—Denver Hilton Hotel, Denver, Colorado, April 16 to 21.
1962—Statler Hotel, Los Angeles, California, April 28 to May 3.
1963—Americana Hotel, Miami Beach, Florida, April 28 to May 2.
1964—Palmer House, Chicago, Illinois, May 10 to 14.
1965—Dallas Statler-Hilton, Dallas, Texas, April 25 to 30.

OFFICERS OF ORTHODONTIC SOCIETIES*

The AMERICAN JOURNAL OF ORTHODONTICS is the official publication of the American Association of Orthodontists and its component societies. The Editorial Board of the JOURNAL is composed of a representative of each of the component societies.

American Association of Orthodontists

(Next meeting April 16-21, 1961, Denver)

President, William R. Humphrey - - - - - - - - - Republic Bldg., Denver, Colo.
President-Elect, Dallas R. McCauley - - - - - - 410 S. Beverly Dr., Beverly Hills, Calif.
Vice-President, Cecil G. Muller - - - - - - - - 101 S. 35th Ave., Omaha, Neb.
Secretary-Treasurer, Earl E. Shepard - - - - - - - 225 South Meramec, Clayton, Mo.

Central Section of the American Association of Orthodontists

President, Leo B. Lundergan - - - - - - - - - 8000 Bonhomme Ave., St. Louis, Mo.
Secretary-Treasurer, Kenneth E. Holland - - - - - 1019 Sharp Bldg., Lincoln, Neb.
Director, Elmer F. Bay - - - - - - - - - - - 216 Medical Arts Bldg., Omaha, Neb.

Great Lakes Society of Orthodontists

(Next meeting Nov. 27-30, 1960, Cincinnati)

President, Hunter I. Miller - - - - - - - - - - 1416 Mott Foundation Bldg., Flint, Mich.
Secretary, Edward A. Cheney - - - - - - - - - 1201 Bank of Lansing Bldg., Lansing, Mich.
Director, Harlow L. Shehan - - - - - - 601 Jackson City Bank Bldg., Jackson, Mich.

Middle Atlantic Society of Orthodontists

President, Kyrle W. Preis - - - - - - - - - - 700 Cathedral St., Baltimore, Md.
Secretary-Treasurer, Charles S. Jonas - - - - - - Mayfair Apts., Atlantic City, N. J.
Director, Louis E. Yerkes - - - - - - - - - - - 825 Linden Ave., Allentown, Pa.

Northeastern Society of Orthodontists

(Next meeting Nov. 13 to 15, 1960, Boston)

President, Henry C. Beebe - - - - - - - - - 60 Charlesgate West, Boston, Mass.
Secretary-Treasurer, David Mossberg - - - - - - 36 Central Park S., New York, N. Y.
Director, Norman J. Hillyer - - - - - - - - 230 Hilton Ave., Hempstead, L. I., N. Y.

Pacific Coast Society of Orthodontists

(Next meeting Aug. 6-10, 1961, Seattle)

President, E. Allen Bishop - - - - - - - - - - 703 Cobb Bldg., Seattle, Wash.
Secretary-Treasurer, Warren A. Kitchen - - - - - 2037 Irving St., San Francisco, Calif.
Director, William S. Smith - - - - - - - - - - 2530 Bissell Ave., Richmond, Calif.

Rocky Mountain Society of Orthodontists

President, William A. Blueher - - - - - - - - - 801 Encino Pl., Albuquerque, N. M.
Secretary-Treasurer, E. H. Mullinax - - - - - - - 8790 W. Colfax, Lakewood, Colo.
Director, Ernest T. Klein - - - - - - - - - - 707 Republic Bldg., Denver, Colo.

Southern Society of Orthodontists

President, Charles E. Harrison - - - - - - - - - 362 Sixth St., S., St. Petersburg, Fla.
Secretary-Treasurer, William H. Oliver - - - - - - 1915 Broadway, Nashville, Tenn.
Director, Boyd W. Tarpley - - - - - - - 2118 Fourteenth Ave., S., Birmingham, Ala.

Southwestern Society of Orthodontists

President, John W. Richmond - - - - - - - 493 Brotherhood Bldg., Kansas City, Kan.
Secretary-Treasurer, Tom M. Matthews - - - - - - 8215 Westchester Dr., Dallas, Texas
Director, Nathan Gaston - - - - - - - - - - - 701 Walnut St., Monroe, La.

American Board of Orthodontics

(Next meeting April 10-15, 1961, Denver)

President, Wendell L. Wylie - - - - - University of California School of Dentistry, San Francisco, Calif.
Vice-President, J. A. Salzmann - - - - - - - - 654 Madison Ave., New York, N. Y.
Secretary, Alton W. Moore - - University of Washington School of Dentistry, Seattle, Wash.
Treasurer, Paul V. Reid - - - - - - - - 1501 Medical Arts Bldg., Philadelphia, Pa.
Historian, B. F. Dewel - - - - - - - - - - - 708 Church St., Evanston, Ill.
Director, Frank P. Bowyer - - - - - - - - 608 Medical Arts Bldg., Knoxville, Tenn.
Director, Nathan G. Gaston - - - - - - - - - - 701 Walnut St., Monroe, La.

*In order to keep this list up to date, the editor depends on the various sectional editors to notify him immediately of changes in officer personnel.